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Identifying psychosocial predictors of medication non-adherence following acute coronary syndrome: a systematic review and meta-analysis

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Keywords (3-6): acute coronary syndrome, medication adherence, psychosocial factors, depression, systematic review, meta-analysis

Abstract

Objective: Medication non-adherence following acute coronary syndrome (ACS) is associated with poor clinical outcomes. A systematic review and meta-analysis were undertaken to identify psychosocial factors associated with medication adherence in patients with ACS.

Methods: A search of electronic databases (Cochrane Library, Medline, EMBASE, PsycINFO, Web of Science, International Pharmaceutical Abstracts, CINAHL, ASSIA, OpenGrey, EthOS and WorldCat) was undertaken to identify relevant articles published in English between 2000 and 2014. Articles were screened against our inclusion criteria and data on study design, sample characteristics, predictors, outcomes, analyses, key findings and study limitations were abstracted.

Results: Our search identified 3609 records, of which 17 articles met our inclusion criteria (15 independent studies). Eight out of ten studies found an association between depression and non-adherence. A meta-analysis revealed that depressed patients were twice as likely to be non-adherent compared to patients without depression (OR = 2.00, 95% CI 1.57-3.33, p = .015). Type D personality was found to predict non-adherence in both studies in which it was measured. Three out of three studies reported that treatment beliefs based on the Necessity-Concerns Framework predicted medication non-adherence and there was some evidence that social support was associated with better adherence. There was insufficient data to meta-analyse all other psychosocial factors identified.

Conclusion: There was some evidence that psychosocial factors, particularly depression, were associated with medication adherence following ACS. Targeting depressive symptoms, screening for Type D personality, challenging maladaptive treatment beliefs, and providing better social support for patients may be useful strategies to improve medication adherence.

1. Introduction

1.1 Background

Acute coronary syndrome (ACS) presents a significant burden for healthcare providers with annual estimates for the number of hospitalisations totalling 175,000 and 595,000 in the UK and US respectively [1,2]. Following ACS, patients are often discharged from hospital with a number of cardiac medications. Despite their therapeutic benefit when used appropriately, many patients do not persist or adhere to the regimen prescribed to them [3,4].

A large meta-analysis estimated that approximately one third of patients were non-adherent to medication after a cardiac event, irrespective of the type of cardiac drug prescribed [5]. A retrospective analysis of 4591 patients with acute myocardial infarction (AMI) found more than 25% had not filled their cardiac medications after 1 week and 20% had still not filled their prescriptions at 4 months post-discharge [6]. Furthermore, a large prospective study of 13,830 patients with ACS found that 20% were non-adherent to angiotensin converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs) 6 months after hospital discharge [7].

In addition to medication non-adherence being highly prevalent, it also predicts poor clinical outcomes in cardiac patients. Suboptimal medication adherence is associated with increased morbidity [8,9,10], mortality [9,11,12], and healthcare cost [8]. Ho [11] found that patients with AMI that discontinued aspirin, β-blocker, and statin within 1 month were 3.8 times more likely to have died by 12 months compared to patients that continued with one or more of the medications.

1.2 Predictors of medication adherence

Most of the research to date has focused on sociodemographic and disease-related factors such as age [6,9,12-16], gender [7,12,14,17,18], and disease comorbidity [9,13,16,19-21]. A recent review by Chen et al. (2015) [22] investigated predictors of medication adherence following ACS and found a lack evidence for these types of factors in predicting adherence. While it is useful to understand how sociodemographic and disease-related factors affect medication adherence, they are generally not amenable to change [22,23]. There is growing interest into how psychosocial factors - cognitive-related, mood-related and social-contextual factors - influence medication adherence, particularly around factors that have the potential to be modified through intervention [3,24].

Cognitive-related factors such as beliefs, perceptions and attitudes towards cardiac treatment may influence medication adherence [25,26]. Previous studies have shown that patient beliefs about medications predicted adherence in other cardiac patient populations including coronary heart disease (CHD) [27], heart failure [28], and hypertension [29]. It is not yet fully understood how beliefs about treatment along with other cognitions affect health behaviour following acute cardiac events.

Mood-related factors such as depression may also affect medication adherence in cardiac patients [30,31]. Depression has been shown to predict treatment non-adherence in patients with CHD [32-38]. In acute cardiac patients, the rate of depression is high (7-31%) [39] and is associated with poor clinical outcomes [40], which may in part be attributed to suboptimal medication adherence.

Other psychosocial factors relating to a patient's social context such as levels of social support may also contribute to medication adherence [41,42]. Understanding a patient's social situation is important in order to decide which treatments are most appropriate and to identify any barriers that may affect treatment adherence [43,44].

Due to the complex nature of medication adherence, it is likely that many factors contribute and overlap with one another. To our knowledge, there are no reviews of the literature pertaining to psychosocial factors in medication non-adherence following ACS.

1.3 Objectives

The aim of this systematic review was to identify psychosocial factors associated with medication non-adherence following ACS and to use meta-analysis to determine the strength of such effects.

2. Methodology

The present study is reported in accordance of both Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) [45] and Meta-analysis Of Observational Studies in Epidemiology (MOOSE) [46] guidelines.

2.1 Search strategy

A search of electronic databases was undertaken in March 2015 that included the Cochrane Library, Medline, EMBASE, PsycINFO, Web of Science, International Pharmaceutical Abstracts, Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Applied Social Sciences Index and Abstracts (ASSIA). An additional online search of three electronic databases - OpenGrey, EthOS and WorldCat – Thesis and Dissertations - was done to identify relevant unpublished and grey literature (work not published in peer-reviewed books and journals).

Our search was limited to English language articles published between 2000 and 2014. The decision to use this search period was based on the publication of the landmark Clopidogrel in Unstable Angina to Prevent Recurrent Events (CURE) trial in 2001 which found dual antiplatelet therapy (DAPT) consisting of clopidogrel paired with aspirin to be clinically effective in patients with coronary artery disease (CAD) [47]. Since the CURE trial, DAPT has been considered a key therapeutic regimen for secondary cardiac prevention [48-52] and it was expected our search would capture studies using the latest cardiac medication prescribing guidelines based on CURE. In addition, limiting the studies to those published in the last 15 years may assist the review to be more relevant to current clinical practice, as there have been many additional drugs and refinements in regimens in the last decade or two that have been shown to enhance outcome.

Our search terms were comprised of three themes: i) disease-related terms (i.e., “acute coronary syndrome”, “myocardial infarction”, “unstable angina”); ii) medication-related terms (i.e., “antiplatelet therapy”, “aspirin”, “statin”), and; iii) adherence-related terms (i.e., “adherence”, “persistence”, “compliance”) (see Appendix I for full search strategy). Independently sourced articles outside of the search results were identified through manually screening reference lists of relevant articles.

2.2 Inclusion criteria

The inclusion criteria were based on the Participants, Interventions, Comparator, Outcomes, and Setting (PICOS) approach in the PRISMA guidance [45]. We defined psychosocial predictors as variables that relate to the influence of social factors on an individual’s mind or behaviour and to the interrelation of behavioural and social factors [53]. Examples of psychosocial factors included: i) cognitive-related: beliefs, perceptions, attitudes, self-efficacy, coping style, ii) mood-related: mood state, perceived stress/stressors, iii) and social contextual: social influences, social support. Studies were included if they met the following criteria:

i) Adult patients with ACS (diagnoses of myocardial infarction (MI) and/or unstable angina) over 18 years of age.

ii) Cross-sectional, retrospective cohort or prospective cohort studies.

iii) Measured adherence (both validated/non-validated methods) to cardiac medications including: antiplatelet agents (aspirin, thienopyridines, DAPT), ACE inhibitors, ARBs, β-blockers or lipid-lowering agents (i.e., statins), calcium channel blockers or diuretics (for treatment of cardiac disease only).

iv) Included a standardized measurement of a psychosocial variable.

v) Assessed the strength of association between the psychosocial factor and adherence.

vi) Articles published in English between 2000 and 2014.

Studies were excluded if they met the following criteria:

i) Primary prevention of ACS.

ii) Patients under 18 years.

iii) No measure of medication adherence.

iv) Focused solely on non-psychosocial variables such as sociodemographic and clinical factors.

v) Articles published pre-2000 and not in English.

2.3 Data collection

Electronic database searches were undertaken by the lead researcher (JC) who used bibliographic software to manage the search results. After duplicates were removed, the remaining articles were screened manually by title and abstract using the inclusion criteria detailed above. Relevant full-text articles were obtained and their eligibility evaluated by the lead researcher. Co-authors (VA and JW) were given a sample of 40 relevant articles that met or almost met the inclusion criteria in order to validate the search process. Any reviewer disagreements were settled by consensus, although interrater reliability was very high. Using a standardised form, information was abstracted for study country, study design, study setting, sample characteristics, sample size, medication class studied, adherence measures, follow up period, psychosocial predictors, predictor measure, main analyses, key findings and study limitations. Authors were contacted if additional information to determine eligibility was required. We contacted three authors for further information which was provided in each case.

2.4 Quality Assessment

To assess study quality, we used an adaptation of the Quality In Prognosis Studies (QUIPS) tool that was developed to identify the risk of bias in studies of prognostic factors [54]. The original QUIPS tool comprises six domains of bias: i) study participation; ii) study attrition; iii) prognostic factor

measurement; iv) outcome measurement; v) confounding measurement and; vi) statistical analyses. Oosterom-Calo et al. [55] adapted the QUIPS tool to include questions (17-items) rather than statements, with each item scored between 1 and 3. Based on an average score across all questions, studies were classified as 'poor', 'fair' or 'good' quality. The adapted QUIPS tool has been used to assess study quality in two recent systematic reviews of medicine adherence in heart failure [55,56].

2.5 Statistical Analysis

Where appropriate, direction of effect was manipulated for consistent reporting (i.e., showing associations between predictors and non-adherence rather than adherence). Where there were sufficient data, the overall effect of each predictor of adherence was pooled using a random effects method for meta-analysis. The most common effect size metric reported were odds ratios. Where another effect size was reported (e.g., standardised mean difference) this was converted to the odds ratio metric [57]. Adjusted effect size estimates were used where available. The I^2 statistic was used to estimate statistical heterogeneity and potential publication bias was determined using funnel plots and Egger's test for small study effects. All analyses were done using Stata 14.1 statistics software package.

3. Results

3.1 Selection process

An online database search of published work identified 5653 records (see Figure 1). A search of unpublished and grey literature identified 35 records and a further 19 records were independently sourced using reference lists of relevant papers. After removing 2098 duplicates, the remaining 3609 records were screened based on their title and abstract. A total of 3316 records were excluded leaving 292 articles for full-text screening. Seventeen studies [58-74] met the inclusion criteria and were included in our review (comprised of 15 independent studies [61,62,67,68]). The most common reasons for exclusion were studies reporting non-psychosocial predictors only, ineligible patient populations, and those only reporting prevalence of non-adherence (see Appendix II for full reasons for exclusion list).

3.2 Study characteristics

3.2.1 Design

Table 1 provides a descriptive summary of the studies included in this review. Over half of the included studies were conducted in the USA [58,61,62,67-70,72,74] and the majority of studies adopted a prospective cohort design [58,60-69,71,73] with follow up ranging from 3 to 24 months.

The total sample size for all included studies was 7401 (median = 208; range = 73 – 2118). Mean age of all participants was 61.8 years (n = 16; SD = 4.54; range = 53 – 75), 67.2% were male (n = 16; SD = 10.55; range = 47.7 – 84) and 85.1% were white (n = 10; SD = 7.86; range = 66 – 96).

3.2.2 Outcomes

Different methods were used to measure medication adherence. Eight studies [59,61,66,69,70,72-74] used validated self-report questionnaires such as the Morisky Medication Adherence Scale (MMAS, 4-items). Six studies [58,60,63-65,71] used non-validated self-report methods such as telephone interviews and three studies [62,67,68] used a Medication Event Monitoring System (MEMS) with cut-offs of either 75% [67,68] or 80% [62].

Adherence to aspirin alone was the most frequently measured drug [62,67,68,70,71] while four studies [59,60,69,72] measured use of aspirin, β-blockers, lipid-lowering agents, and ACE inhibitors/ARBs. Six studies did not specify the type of cardiac medication in which adherence was being measured [61,64-66,73,74]. Rates of non-adherence based on medication class can be seen in Table 2.

3.2.3 Quality assessment

Based on QUIPS tool criteria [55], all included studies were rated as 'good' [60-62,64-69,72-74] or 'fair' [58,59,63,70,71] quality. Methodological issues among 'fair' rated studies included not reporting baseline comparisons between responders and non-responders [58,59,70,71] and inadequate reporting of all predictor variables/covariates [58,59] (see Appendix III for full quality assessment screening).

3.3 Psychosocial predictors of medication adherence

Table 3 provides an overview of psychosocial predictors and their relationship with medication non-adherence.

3.3.1 Mood-related factors

Depression

Eight of ten studies found depression to be associated with non-adherence [58-62,67-69]. Six of the eight were rated as 'good' quality [60-62,67-69] and seven were prospective cohort studies [58,60-62,67-69].

Three prospective studies [62,67,68] found depression predicted aspirin non-adherence while another study [58] found an associated between depression and non-adherence to ACE inhibitors/ARBs and lipid-lowering agents. Four studies [59-61,69] that found an effect did not specify cardiac drug class.

Two studies using the same patient sample compared patients post-ACS based on the course [67] and severity [68] of depression. Patients with persistent depression (baseline and 3 months follow up) were more likely to be non-adherent to MEMS-measured aspirin compared to patients with remittent depression or those without depression [67]. Additionally, patients with severe depression were over three times more likely to be non-adherent to aspirin post ACS compared to those without depression [68]. One study [60] found depression predicted non-adherence but only in patients younger than 65 years.

Two studies found no relationship between depression and medication adherence [63,71]. One study [63] found depression did not significantly predict non-adherence to aspirin, antihypertensives, and lipid-lowering agents. Another small study [71] also found no effect between depression and medication non-adherence. Depression was also found not to be associated with non-adherence to β-blockers in one study, but did predict non-adherence to other cardiac medicines [58].

Type D personality

Type D is considered the 'distressed' personality type and is comprised of two domains, negative affectivity and social inhibition. Two studies [66,73] that investigated Type D as a predictor of medication non-adherence found patients classified as having Type D personality were more likely to be

non-adherent at 3 months [73] and 6 months [66] following ACS. When assessed categorically, only negative affectivity predicted non-adherence in both studies. Self-efficacy was found to partially mediate the relationship between negative affectivity and medication non-adherence in one study [66].

3.3.2 Cognitive-related factors

Treatment beliefs

Three studies found evidence that treatment beliefs predicted medication non-adherence [58,70,72], however, there was inconsistency in the findings. Using the Beliefs about Medicines Questionnaire (BMQ), a prospective study found beliefs about drug necessity (Specific-Necessity) and also concerns about taking medication (Specific-Concern) predicted non-adherence to β-blockers, ACE inhibitors/ARBs, and lipid-lowering agents [58]. A cross-sectional study [72] found that lower scores on the Specific-Necessity subscale of the BMQ predicted lower self-reported adherence following ACS. Conversely, a cross-sectional study of 'fair' quality [70] found only the Specific-Concern subscale predicted non-adherence to aspirin after ACS.

3.3.3 Social contextual factors

Few studies have measured the effect of social support in predicting medication adherence following ACS. One prospective study [64] measured practical and emotional support in patients following ACS. Patients with lower practical support were more likely to be non-adherent to medication 12 months on, however, there was no such effect for emotional support. Additionally, one cross-sectional study [59] found that lower levels of social support predicted medication non-adherence after controlling for sociodemographic and clinical factors.

One prospective study measured social network size, here considered a proxy measure of social support [65], but found no effect on medication non-adherence 12 months after ACS. This study did, however,

find that self-reported partner stress (patients rated this based on preceding 6 months prior to ACS onset) was associated with poor medication adherence.

There were other psychosocial factors that were only investigated in singular studies. One study [62] measured cognitive (dysfunctional attitudes), behavioural (engaging in pleasant events), and psychosocial (role transitions, interpersonal conflict) vulnerabilities to determine their association with depression and medication non-adherence. Role transitions and interpersonal conflict were found to independently predict MEMS-measured aspirin non-adherence 3 months after ACS. One cross-sectional study found that life chaos – having a chaotic lifestyle and environment – was associated with self-reported non-adherence in patients with a history of AMI [74]. Another study [71] found that patients exhibiting symptoms for post-traumatic stress disorder (PTSD) were more likely to be non-adherent to aspirin following ACS.

3.4 Meta-analysis

Depression was the only psychosocial predictor identified with sufficient data for a meta-analysis. Figure 2 shows the pooled effect sizes (n = 5058; median = 492) for depression as a significant predictor of non-adherence (*k* = 7, [58-61,63,68,69]), OR = 2.00, 95% CI 1.57-3.33, p = .015. Three studies were excluded from this analysis based on unsuitable data [71] or not having an independent study sample [62,67]. An I^2 statistic of 61.9% suggests moderate to substantial statistical heterogeneity between studies. Publication bias was determined using a funnel plot (see Appendix IV). Additionally, Egger's test for small study effects indicated no significant bias (p = .176) though power was an issue with only seven studies and there was some indication of missing small studies with negative results. A sensitivity analysis using the trim and fill method [91] generated a pooled random effects estimate of OR = 1.90 (95% CI 1.53-2.37), which suggested the pooled effect size is likely to be robust to potential publication bias.

Figure 3 shows the pooled effect sizes for depression stratified by medication classification. When medication class was not specified (n = 3232; median = 480.5) depression was significantly associated with non-adherence (*k* = 4 [59-61,69]), OR = 2.05, 95% CI 1.39-3.03, p = .003. There were no other effects found between depression and non-adherence to specific cardiac medications (ACE inhibitors/ARBs, lipid-lowering agents, β-blockers, aspirin or antihypertensives).

4. Discussion

To our knowledge, this is the first study to review and meta-analyse the evidence regarding psychosocial determinants of medication non-adherence following ACS. Our study included 17 studies that assessed a range of psychosocial factors relating to patients' mood, cognition and social context.

Depression was the most commonly studied psychosocial factor and was found to predict adherence in the majority of studies (eight of ten studies; [58-62,67-69]. Our analysis revealed that patients exhibiting depressive symptoms following ACS were twice as likely to be non-adherent compared to non-depressed. When the class of medication was not specified (i.e., any cardiac medication), depression was associated with a 2.05 increased risk of non-adherence. There was no such association found between depression and other specific cardiac medications, however, this is likely to have been affected by the small number of studies testing these relationships. Our findings are congruous with previous studies that have found strong associations between depression and medication non-adherence in patients with CAD [32,34,37].

We found patients classified as having Type D or 'distressed' personality type were more likely to be non-adherent to medication following ACS. Individuals with Type D personality have a propensity for negative affectivity (i.e., worry and stress) and social inhibition (i.e., anxiety and apprehension) [92]. Our

review found evidence that when measured categorically, negative affectivity predicted adherence while social inhibition did not.

In addition to mood-related factors, this review also provided some evidence that cognitive factors such as treatment beliefs based on the Necessity-Concerns Framework (NCF) were associated with medication non-adherence [26]. Stronger beliefs about needing medicines (necessity beliefs) coupled with a lack of concern about medicines potentially causing harm (concern beliefs) predicted better adherence, however, there was insufficient data available to conduct a meta-analysis of the three studies included. These finding support previous studies that have used the NCF to predict medication adherence in other cardiac conditions including CHD [27], heart failure [28], and hypertension [29].

There was some evidence that the social context or situation of patients affects medication-taking behaviour. Findings from single studies revealed that increased partner stress, interpersonal conflict, number of role transitions, and perceived life chaos are all factors associated with medication non-adherence. In addition, lower perceived social support and, in particular, practical support was also found to predict medication adherence. While this evidence is compelling, there are not enough studies investigating the role of such social contextual factors to draw firm conclusions.

We believe that this review is the first to specifically identify psychosocial factors related to post-ACS medication use. A recent review by Chen et al. (2015) [22] did investigate predictors of medication adherence post-ACS, however, it focused on sociodemographic and clinical factors rather than psychosocial correlates. There was little overlap between the two reviews in terms of eligible studies with just two included in both reviews [58,68].

The link between depression and cardiac disease has long been established and the mechanisms behind this relationship widely discussed [40]. It has been posited that negative health behaviours may mediate the relationship between depression and risk of acute cardiac episodes [31]. The recent Coronary

Psychosocial Evaluation Studies (COPES) trial investigated the effect of an enhanced depression intervention to improve adherence to secondary prevention behaviours following ACS [93]. Findings from the COPES trial highlight the need for future work to focus on identifying specific adherence intervention strategies that can be implemented alongside treatment for depression.

Negative beliefs about treatment or about illness more generally may act as a barrier to adherence. Challenging treatment beliefs and illness perceptions may be a useful strategy to improve rates of adherence, however, the effectiveness of interventions have been mixed [94]. Petrie et al. [95] developed an intervention to change how patients perceived their illness following MI. Patients receiving the intervention were less likely to believe their illness was permanent and felt more in control of their recovery. They also reported fewer angina symptoms and returned to work quicker than those in the control group. In a similar study, Broadbent et al. [96] found their intervention improved patients' understanding of their condition and altered beliefs about illness causation. The intervention group again returned to work quicker than controls. Further work should focus on developing novel behaviour change techniques focused on the cognitive processes involved in making treatment decisions and following treatment advice.

This review found some evidence that social support was associated with medication adherence, specifically practical support. DiMatteo [41] investigated the association between social support and treatment adherence across diseases and conditions. Findings from 29 studies revealed that practical support was strongly correlated with treatment adherence and that the risk of non-adherence was almost double among patients lacking practical support. Promoting existing contacts such as friends and family to support patients with the practical aspects of drug purchasing and administration has been suggested as an effective strategy to improve adherence [42].

Previous evidence has shown that treatment non-adherence is a significant barrier to recovery after an ACS event. Poor clinical responses to treatment can be easily interpreted as an issue with the therapy rather than attributed to a problem with adherence [97]. This may lead to needless dose increases, unnecessary augmentation of therapy with additional medications, or loss of clinical benefit due to discontinuation of the medicine for perceived lack of effect. Further, this can affect clinical outcomes such as increasing the risk of adverse events. Identifying factors associated with medication non-adherence is important in order to highlight patients at risk and to offer additional support for those experiencing difficulties with their medications.

4.1 Clinical implications

Adherence is a complex health behaviour that is unsurprisingly associated with a range of psychosocial factors. Routinely screening for psychosocial factors such as depression, treatment beliefs, and levels of social support after an ACS event may be an effective approach to identify individuals at risk of adherence problems. The BDI and PHQ are self-report measures that are both well-validated and easy to administer in an acute setting and may be a suitable option for clinicians to use routinely to screen for depression in patients with ACS [98].

In addition, the BMQ has shown good reliability in measuring patients' beliefs about drug necessity and concern in cardiac populations [27-29] and could be utilised in clinical settings to recognise maladaptive beliefs around medication use. One strategy could be to administer the BMQ prior to hospital discharge to identify patients' attitudes towards medications. This information could then be discussed during a subsequent follow up appointment with their primary care provider. A strategy such as this would provide an opportunity for an open discussion between patient and care provider where any negative beliefs or misconceptions about medicines could be identified and treated accordingly.

The findings from this review highlight the importance of psychosocial factors in terms of medication use, however, there may be wider influences on recovery following ACS. There is evidence that psychosocial factors such as illness perceptions [99-101] and depression [102-104] predict other behavioural components of a cardiac treatment regimen such as smoking cessation and exercise training/rehabilitation. Thus, addressing psychosocial factors could potentially have an even larger role in improving medical outcome in cardiac patients.

There are a variety of methods to measure medicine adherence including self-report questionnaires, pill counts, frequency of dispensing, timing of prescription refills, electronic monitors and biochemical indicators. There are pros and cons to each method of measurement [105]. For example, self-report questionnaires are cheap and easy to administer in most clinical settings, however, may underestimate non-adherence because of patients' desire to be perceived as compliant (social desirability bias). Electronic monitors provide real-time information about when a patient accesses their pill container, however, there is no guarantee that the medicine is taken after the container is accessed. Finding the most appropriate method to measure adherence is a contentious issue and despite a range of different methods available, there is currently no 'gold standard' to measure adherence that is equally accurate, sensitive, and practical to use [3]. This presents a challenge for those working in adherence research and highlights the need for further work to be done in developing appropriate tools for measurement [106].

4.2 Limitations

- The decision to search only for articles in English was based on convenience. As a result, potentially relevant non-English articles would have been missed. In addition, we only searched for articles published between 2000 and 2014 meaning that pre-2000 publications were overlooked. This decision was based on the publication date of the CURE trail which advocated the use of DAPT to treat ACS [47]. We expected to find some studies that had investigated the

role of psychosocial factors in determining DAPT adherence, however, our search strategy found none.

- Only the lead researcher (JC) manually screened all articles, thus limiting the validity of the search process. Co-authors (VA and JW) were only partially involved in full-text screening using the inclusion criteria. Ideally, multiple members of the research team should screen all articles identified in the search process.
- When undertaking a systematic review, there is always a risk of publication bias where negative studies of predictors not being associated with non-adherence might be less likely to get published. We tried to ameliorate this issue by undertaking a grey literature search of unpublished work. None of the included studies were identified using this search strategy.
- A number of the studies did not use validated measures of medication adherence which limits the strength of their findings. We decided not to exclude studies based on the method used to measure adherence as this would have significantly reduced the number of included articles. This particular point is indicative of a wider issue around measuring medication adherence.

4.3 Conclusions

This review and meta-analysis found evidence that psychosocial factors are associated with medication adherence following ACS. Firstly, we found that depression was a significant risk factor for non-adherence and along with individuals classified as having a Type D personality could be routinely screened for during hospitalisation. Secondly, there was some evidence that cognitive-related factors such as treatment beliefs also predicted medication adherence. Emphasising the necessity of medicines in improving health and addressing concerns about medicines may be a useful strategy to improve adherence. Finally, offering better support for patients and placing a greater emphasis on understanding their social situation may also provide an avenue for treatment for patients with ACS. Based on the

findings of this review, we suggest that psychosocial factors are important in determining adherence and future work should focus on how to target these types of patient-related factors to improve health outcomes following ACS.

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Author	Year	Country	Study design	Setting	Follow up (months)	Sample	Sample size	Sample demographics
Allen La Pointe et al. [58]	2011	USA	PC	Inpatients, 41 hospitals	3	ACS	973	β-blocker cohort: Mean age = 59; Male = 70%; White = 81% ACEi/ARBs cohort: Mean age = 59; Male = 70%; White = 79% LL therapy cohort: Mean age = 58; Male = 69%; White = 82%
Castellano et al. [59]	2014	Various	CS	Outpatients, 64 clinics	N/A	AMI	2118	Mean age = 64 Male = 64%
Jin et al. [60]	2014	China	PC	Inpatients, 1 hospital	24	ACS	469	Mean age = 62 Male = 70%

Kronish et al. [61]	2006	USA	PC	Inpatients, 3 hospitals	3	ACS	492	Mean age = 61 Male = 59%
Kronish et al. [62]	2014	USA	PC	Inpatients, 3 hospitals	3	ACS	169	Mean age = 59 Male = 56% White = 86%
McGee et al. [63]	2006	Ireland	PC	Inpatients, 39 hospitals	12	ACS	681	Mean age = 63 Male = 76% White = 87%
Molloy et al. [64]	2008	England	PC	Inpatients, 4 hospitals	12	ACS	262	Mean age = 61 Male = 77%

Molloy et al. [65]	2008	England	PC	Inpatients, 4 hospitals	12	ACS	193	Mean age = 61 Male = 77% White = 86%
Molloy et al. [66]	2012	England	PC	Inpatients, 1 hospital	6	ACS	165	Mean age = 62 Male = 84% White = 86%
Rieckmann et al. [67]	2006	USA	PC	Inpatients, 2 hospitals	3	ACS	165	Mean age = 59 Male = 48% White = 87%
Rieckmann et al. [68]	2006	USA	PC	Inpatients, 2 hospitals	3	ACS	172	Mean age = 59

								Male = 55% White = 87%
Romanelli et al. [69]	2011	USA	PC	Inpatients, 1 hospital	4	AMI	153	Mean age: 75 Male = 56% White = 92%
Schulman-Marcus et al. [70]	2013	USA	CS	-	N/A	ACS	510	-
Shemesh et al. [71]	2004	Isreal	PC	Outpatients, 1 clinic	12	MI	73	Mean age = 53 Male = 80%
Sud et al. [72]	2005	USA	CS	Outpatients, 1 hospital	N/A	ACS	208	Mean age = 65 Male = 61% White = 96%

Williams et al. [73]	2011	Scotland	PC	Inpatients, 1 hospital	3	MI	192	Mean age = 66 Male = 72%
Zullig et al. [74]	2013	USA	CS	Outpatients, 1 hospital	N/A	MI	406	Mean age = 61 Male = 72% White = 66%

Author	**Psychosocial predictors**	**Psychosocial predictor measures**	**Outcome**	**Outcome measure**	**Outcome drug(s)**	**Quality score**
Allen La Pointe et al. [58]	Treatment beliefs	BMQ-Specific	Self-reported adherence	Telephone interview (1 item)	β-blocker	Fair
	Depression	-			ACEi/ARBs	

					LL therapy	
Castellano et al. [59]	Depression	PHQ-9	Self-reported adherence	MMAS-4	Does not break down by drug type (in analysis)	Fair
	Social support	-				
Jin et al. [60]	Depression	PHQ-9	Self-reported adherence	Telephone interview (1-2 items)	Does not break down by drug type (in analysis)	Good
Kronish et al. [61]	Depression	BDI	Self-reported adherence	MMAS-4	Does not break down by drug type	Good
Kronish et al. [62]	Depression	BDI	Indirect measure of adherence	MEMS (80% cutoff)	Aspirin	Good
	Cognitive vulnerability	DAS-24				
	Behavioural vulnerability	PES-E				
	Psychosocial vulnerability	Interpersonal conflict = IPARS & Role transitions =				

		DAS				
McGee et al. [63]	Depression	HADS-D/BDI-FS	Self-reported adherence	Non-validated questionnaire	Aspirin Antihypertensives LL therapy	Fair
Molloy et al. [64]	Social support Depression	Interview, measure devised by Berkman et al. (1992) BDI	Self-reported adherence	Telephone interview (3 items)	Does not break down by drug type	Good
Molloy et al. [65]	Social network size Partner stress	Questionnaire devised by Cohen et al. (1997) (12 items) Clinical interview (1 item) DS-16 (negative affectivity subscale)	Self-reported adherence	Telephone interview (3 items)	Does not break down by drug type	Good
Molloy et al. [66]	Type D personality Self-efficacy	DS-14 Measure devised by Rohrbaugh et al.	Self-reported adherence	MARS	Does not break down by drug type	Good

		(2004) (10 items)				
	Depression	BDI				
	Social support	Measure devised by Berkman et al. (2003) (7 items)				
Rieckmann et al. [67]	Depression	BDI	Indirect measure of adherence	MEMS (75% cutoff)	Aspirin	Good
Rieckmann et al. [68]	Depression	BDI	Indirect measure of adherence	MEMS (75% cutoff)	Aspirin	Good
Romanelli et al. [69]	Depression	BDI	Self-reported adherence	MOSSAS	Does not break down by drug type (in analysis)	Fair

Schulman-Marcus et al. [70]	Treatment beliefs	BMQ-Specific	Self-reported adherence	MMAS	Aspirin	Fair
Shemesh et al. [71]	PTSD symptoms	IES	Self-reported adherence	Interview & biomarker test (thromboxane)	Aspirin	Fair
	Depression	SCL-90-R (depression subscale)				
	Global distress	SCL-90-R (global distress subscale)				
Sud et al. [72]	Treatment beliefs	BMQ	Self-reported adherence	MMAS-4	Does not break down by drug type (in analysis)	Good
Williams et al. [73]	Type D personality	DS-14	Self-reported adherence	MARS	Does not break down by drug type	Good
Zullig et al. [74]	Life chaos	Adaptation of CHAOS (6 items)	Self-reported adherence	MMAS-4	Does not break down by drug type	Good

Notes.

- = Not reported

N/A = Not applicable

Definitions.

PC = Prospective cohort

CS = Cross-sectional

ACS = Acute coronary syndrome

AMI = Acute myocardial infarction

MI = Myocardial infarction

ACEi = Angiotensin converting enzyme inhibitor

ARBs = Angiotensin II receptor blockers

LL therapy = Lipid-lowering therapy

BMQ = Beliefs about Medicines Questionnaire [26]

PHQ-9 = The Patient Health Questionnaire [75]

BDI = Beck Depression Inventory [76]

DAS-24 = Dysfunctional Attitudes Scale [77]

PES-E = Pleasant Events Schedule for the Elderly [78]

IPARS = Interpersonal Problem Area Rating Scale [79]

DAS = Dyadic Adjustment Scale [80]

HADS-D = Hospital Anxiety and Depression Scale (depression subscale) [81]

BDI-FS = Beck Depression Inventory-Fast Scale [82]

DS-16 = The Type D Scale-16 [83]

IES = Impact of Event Scale [84]

SCL-90-R = Symptom Checklist-90-Revised [85]

DS-14 = The Type D Scale-14 [86]

CHAOS = Confusion, Hubbub, and Order Scale [87]

MMAS-4 = Morisky Medication Adherence Scale-4 [88]

MEMS = Medication Event Monitoring System

MARS = Medication Adherence Report Scale [89]

MOSSAS = Medical Outcomes Study Specific Adherence Scale [90]

Table 1. Data extraction table for the included studies

	Drug classes									
Follow up	Aspirin	Studies	β-blocker	Studies	ACEi/ARBs	Studies	LL therapy	Studies	Class not specified	Studies
3 months	37%† - 42%*	[68,67]	23%	[58, 62]	26%	[58]	23%	[58]	30%*	[61]
12 months	13% - 16%	[63,71]	-		-		16%	[63]	44% - 50%	[65,64]
24 months	68%	[60]	71%	[60]	67%	[60]	75%	[60]	-	
Cross-sectional	13%	[72]	20%	[72]	44%	[72]	24%	[72]	43% - 55%	[74,72,59]

Notes.

Studies where rates of medication non-adherence not reported [66,69,70,73]

† = Non-adherence rates for moderate/severe depression subgroup

* = Non-adherence rates for persistently depressed subgroup

Table 2. Rates of cardiac medication non-adherence according to drug class and follow up

Predictive factors	Author	Year	Quality score	Study design	Main analysis	Covariates included	Effect
Mood-related factors							
Depression (n = 10)							
Significant effect	Allen La Pointe et al. [58]	2011	Fair	PC	Multivariate logistic regression	SocDem, clinical, health behaviours, BMQ scores	ACEi/ARBs: OR = 1.33; 95% CI 1.01-1,76; p < .05 LL therapy: OR = 1.74; 95% CI 1.36-2.23; p < .05
	Castellano et al. [59]	2014	Fair	CS	Multivariate logistic regression	SocDem, clinical, health behaviours	OR = 1.07; 95% CI 1.04-1.09; p < .001
	Jin et al. [60]	2014	Good	PC	Multivariate logistic regression	SocDem, comorbidity score	OR = 2.62; 95% CI 2.03-3.38; p < .001
	Kronish et al. [61]	2006	Good	PC	Multivariate logistic regression	SocDem, comorbidity score	OR = 2.00; 95% CI 1.05-3.70, p < .05
	Kronish et al. [62]	2014	Good	PC	Multivariate linear regression	SocDem, comorbidity score, depression vulnerabilities	Aspirin: beta = 0.42; p = .04
	Rieckmann et al. [67]	2006	Good	PC	χ^2 analysis	N/A	Aspirin: χ^2 = 11.5; p = .01
	Rieckmann et al. [68]	2006	Good	PC	Multivariate logistic regression	SocDem, comorbidity score	Aspirin: OR = 3.7; 95% CI 1.3-10.6; p < .05
	Romanelli et al. [69]	2011	Good	PC	ANOVA	N/A	F = 4.80; p = .03

Non-significant effect	McGee et al. [63]	2006	Fair	PC	Logistic regression	Unadjusted	Aspirin: OR = 2.0; 95% CI 0.8-3.3; p = .11 Antihypertensives: OR = 1.1; 95% CI 0.6-2.0; p = .73 LL therapy: OR = 1.7; 95% CI 0.8-3.3; p = .16
	Shemesh et al. [71]	2004	Fair	PC	Mean difference in depression scores	N/A	Aspirin: M: 22.6 ± SD: 11.8 vs. M: 22.9 ± SD: 11.8; p = .93
	Allen La Pointe et al. [58]	2011	Fair	PC	Multivariate logistic regression	SocDem, clinical, health behaviours, BMQ scores	β-blocker: OR = 1.28; 95% CI 0.95-1.73; p > .05
Type D personality (n = 2)							
Significant effect	Molloy et al. [66]	2012	Good	PC	Multivariate linear regression	Baseline adherence scores	beta = 0.73; p < .01
	Williams et al. [73]	2011	Good	PC	Multivariate linear regression	SocDem, clinical	beta = 0.48; p < .01
Cognitive-related factors							
Necessity beliefs (BMQ; n = 3)							
Significant effect	Allen La Pointe et al. [58]	2011	Fair	PC	Multivariate logistic regression	SocDem, clinical, health behaviours, depression	β-blocker: OR = 0.94; 95% CI 0.90-0.98; p < .05 ACEi/ARBs: OR = 0.93; 95% CI 0.88-0.98; p < .05 LL therapy: OR = 0.95; 95% CI 0.91-0.99; p < .05

	Sud et al. [72]	2005	Good	CS	Multivariate linear regression	SocDem, comorbidity score	beta = -0.262; p = .001
Non-significant effect	Schulman-Marcus et al. [70]	2013	Fair	CS	Multivariate logistic regression	SocDem	Aspirin: statistics not reported, only that it was non-significant
Concern beliefs (BMQ; n = 3)							
Significant effect	Allen La Pointe et al. [58]	2011	Fair	PC	Multivariate logistic regression	SocDem, clinical, health behaviours, depression	β-blocker: OR = 1.10; 95% CI 1.05-1.16; p < .05 ACEi/ARBs: OR = 1.06; 95% CI 1.01-1.11; p < .05 LL therapy: OR = 1.09; 95% CI 1.04-1.14; p < .05
	Schulman-Marcus et al. [70]	2013	Fair	CS	Multivariate logistic regression	SocDem	Aspirin: OR = 1.42; 95% CI 1.13-1.79; p < .05
Non-significant effect	Sud et al. [72]	2005	Good	CS	Multivariate linear regression	SocDem, comorbidity score	beta = 0.033; p = .70
Social contextual factors							
Social support (n = 3)							
Significant effect	Castellano et al. [59]	2014	Fair	CS	Multivariate logistic regression	SocDem, clinical, health behaviours	OR = 0.94; 95% CI 0.92-0.96; p < .001
	Molloy et al. [64]	2008	Good	PC	Multivariate logistic regression	SocDem, clinical, depression	OR = 0.47; 95% CI 0.23-0.94; p = .03

Non-significant effect	Molloy et al. [65]	2008	Good	PC	Multivariate logistic regression	SocDem, clinical, negative affectivity, relationship stress	OR = 0.72; 95% CI 0.31-1.67; p = .44
Relationship stress (n = 1)							
Significant effect	Molloy et al. [65]	2008	Good	PC	Multivariate logistic regression	SocDem, clinical, negative affectivity, social network size	OR = 2.92; 95% CI 1.21-7.08, p = .02
Role transitions (n = 1)							
Significant effect	Kronish et al. [62]	2014	Good	PC	Multivariate linear regression	SocDem, comorbidity score, depression	Aspirin: beta = 3.32; p = .02
Interpersonal conflict (n = 1)							
Significant effect	Kronish et al. [62]	2014	Good	PC	Multivariate linear regression	SocDem, comorbidity score, depression	Aspirin: beta = 3.78; p = .03
Life chaos (n = 1)							
Significant effect	Zullig et al. [74]	2013	Good	CS	Multivariate logistic regression	SocDem, health literacy scores	OR = 1.07; 95% CI 1.02-1.12; p < .05
PTSD (n = 1)							
Significant effect	Shemesh et al. [71]	2004	Fair	PC	Mean difference in depression scores	N/A	Aspirin: p = .008 (M & SD not reported)

Notes.

Did not breakdown by drug type in analysis unless otherwise stated.

Definitions.

ACEi = Angiotensin converting enzyme inhibitor

ARBs = Angiotensin II receptor blockers

LL therapy = Lipid-lowering therapy

PC = Prospective cohort

CS = Cross-sectional

BMQ = Beliefs about Medicines Questionnaire [26]

SocDem = Sociodemographic factors

PTSD = Post-traumatic stress disorder

OR = Odds ratios

CI = Confidence intervals

M = Mean

SD = Standard deviation

Table 3. Analyses and effects found between psychosocial predictors and medication non-adherence

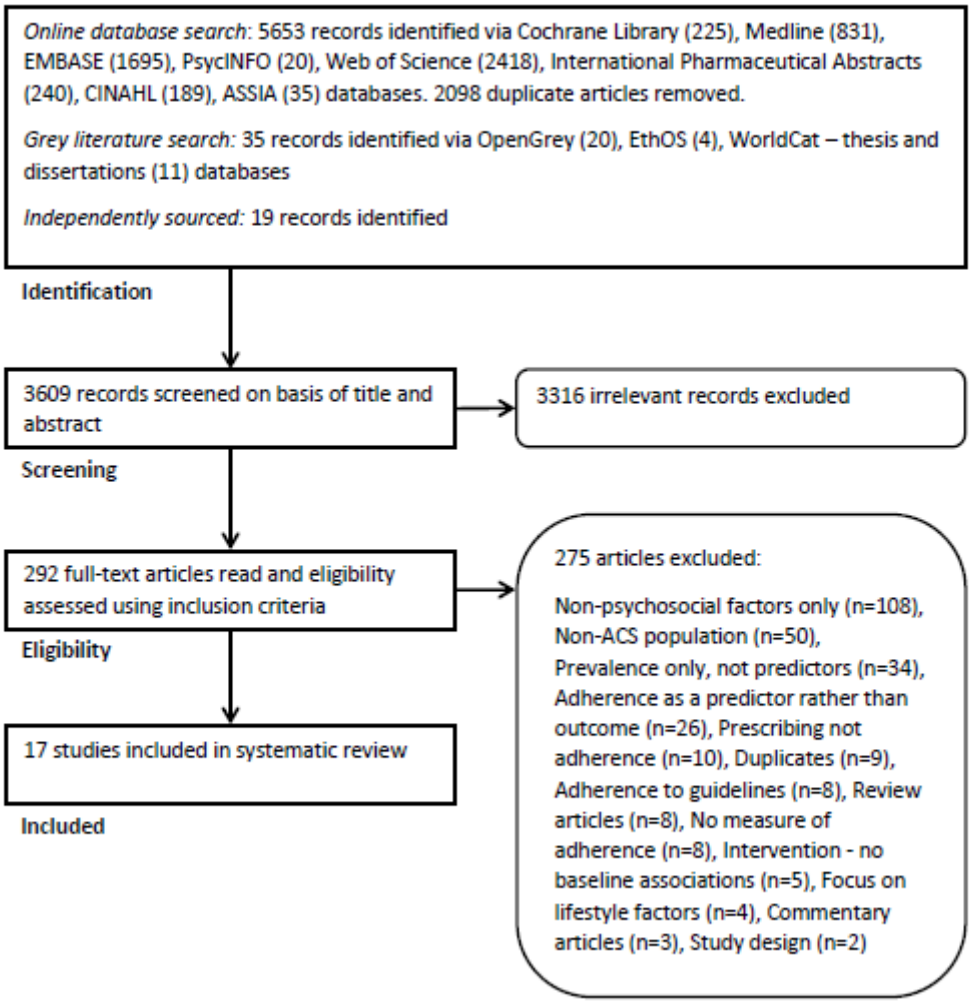


Figure 1. PRISMA flow diagram showing the study selection process

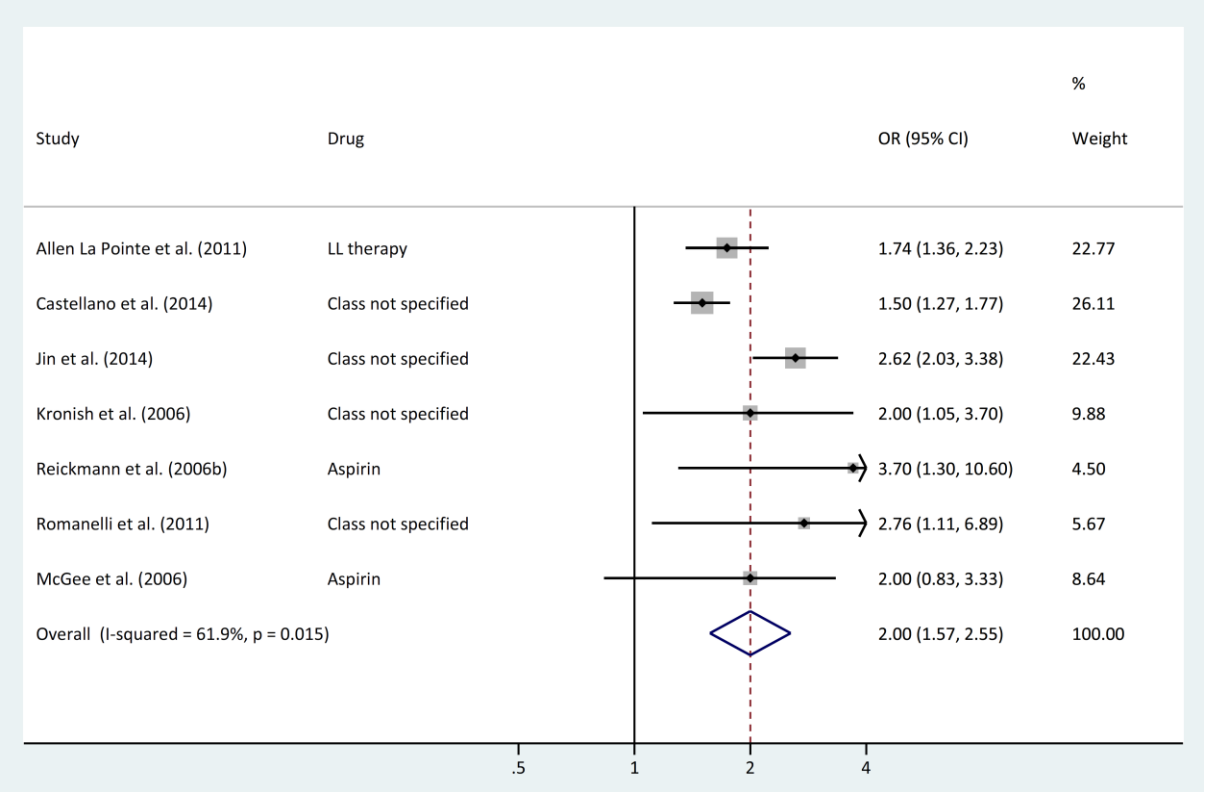


Figure 2. Forrest plot showing pooled effect sizes for selected studies that measured depression as a predictor of medication adherence

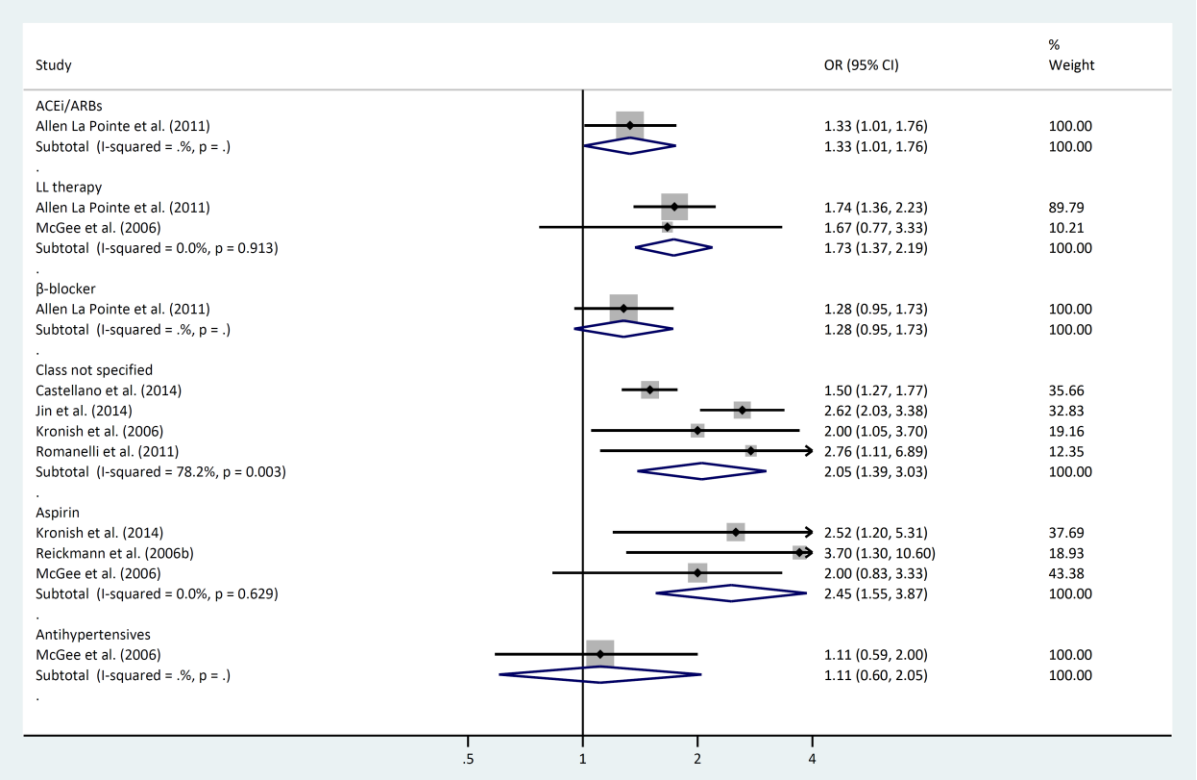


Figure 3. Forrest plot showing pooled effect sizes for studies that measured depression stratified by medication class

Medline, EMBASE, PsycINFO, International Pharmaceutical Abstracts

(treatment adherence or treatment nonadherence or treatment non-adherence or treatment non adherence or treatment compliance or treatment noncompliance or treatment non-compliance or treatment non compliance or treatment concordance or treatment discordance or treatment persistence or treatment nonpersistence or treatment non-persistence or treatment non persistence or treatment continuation or treatment discontinuation) OR (medic* adherence or medic* nonadherence or medic* non-adherence or medic* non adherence or medic* compliance or medic* noncompliance or medic* non-compliance or medic* non compliance or medic* concordance or medic* discordance or medic* persistence or medic* nonpersistence or medic* non-persistence or medic* non persistence or medic* continuation or medic* discontinuation) OR (drug* adherence or drug* nonadherence or drug* non-adherence or drug* non adherence or drug* compliance or drug* noncompliance or drug* non-compliance or drug* non compliance or drug* concordance or drug* discordance or drug* persistence or drug* nonpersistence or drug* non-persistence or drug* non persistence or drug* continuation or drug* discontinuation) OR (pharmac* adherence or pharmac* nonadherence or pharmac* non-adherence or pharmac* non adherence or pharmac* compliance or pharmac* noncompliance or pharmac* non-compliance or pharmac* non compliance or pharmac* concordance or pharmac* discordance or pharmac* persistence or pharmac* nonpersistence or pharmac* non-persistence or pharmac* non persistence or pharmac* continuation or pharmac* discontinuation) OR (regimen adherence or regimen nonadherence or regimen non-adherence or regimen non adherence or regimen compliance or regimen noncompliance or regimen non-compliance or regimen non compliance or regimen concordance or regimen discordance or regimen persistence or regimen nonpersistence or regimen non-persistence or regimen non persistence or regimen continuation or regimen discontinuation)

AND

(("acute coronary syndrome" or "ACS" or "heart attack" or myocardial infarct* or "MI" or "acute myocardial infarction" or "AMI" or "STEMI" or "NSTEMI" or "coronary thrombosis" or "coronary occlusion" or "unstable angina" or "unstable angina pectoris") not (motivational interviewing or motivational-interviewing))

AND

(antiplatelet or anti-platelet or dual antiplatelet therap* or dual-antiplatelet therap* or DAPT or DAT or aspirin or acetylsalicylic acid or ASA or clopidogrel or plavix or ticagrelor or brilinta or brilique or possia or prasugrel or ef?ient or thienopyridine or high dose statin or high-dose statin or high intensity statin or high-intensity statin or cardiac medic* or cardiac drug* or cardiac pharmaco* or heart medic* or heart drug*)

Limits: English language, published between 2000-2014

Cochrane Library

(Title, Abstract, Keyword) - "adherence" or "non-adherence" or "nonadherence" or "non adherence" or "compliance" or "non-compliance" or "noncompliance" or "non compliance" or "concordance" or "discordance" or "persistence" or "non-persistence" or "nonpersistence" or "non persistence" or "continuation" or "discontinuation"

AND

(Title, Abstract, Keyword) - "acute coronary syndrome" or "ACS" or "heart attack" or myocardial infarct* or "MI" or "acute myocardial infarction" or "AMI" or "STEMI" or "NSTEMI" or "coronary thrombosis" or "coronary occlusion" or "unstable angina" or "unstable angina pectoris"

AND

(Title, Abstract, Keyword) - "antiplatelet" or “anti-platelet” or "DAPT" or "DAT" or "aspirin" or "ASA" or “acetylsalicylic acid” or "clopidogrel" or "prasugrel" or "ticagrelor" or "thienopyridine" or "statin" or “medicine” or “medication” or “drug” or “pharmacotherapy”)

Limits: English language, published between 2000-2014

Web of Science

TS=("treatment adherence" or "treatment nonadherence" or "treatment non-adherence" or "treatment non adherence" or "treatment compliance" or "treatment noncompliance" or "treatment non-compliance" or "treatment non compliance" or "treatment concordance" or "treatment discordance" or "treatment persistence" or "treatment nonpersistence" or "treatment non-persistence" or "treatment non persistence" or “treatment continuation" or “treatment discontinuation”) OR TS=(“medic* adherence" or "medic* nonadherence" or "medic* non-adherence" or "medic* non adherence" or "medic* compliance" or "medic* noncompliance" or "medic* non-compliance" or "medic* non compliance" or "medic* concordance" or "medic* discordance" or "medic* persistence" or "medic* nonpersistence" or "medic* non-persistence" or "medic* non persistence" or “medic* continuation" or “medic* discontinuation”) OR TS=("drug* adherence" or "drug* nonadherence" or "drug* non-adherence" or "drug* non adherence" or "drug* compliance" or "drug* noncompliance" or "drug* non-compliance" or "drug* non compliance" or "drug* concordance" or "drug* discordance" or "drug*

persistence" or "drug* nonpersistence" or "drug* non-persistence" or "drug* non persistence" or “drug* continuation" or “drug* discontinuation”) OR TS=("pharmac* adherence" or "pharmac* nonadherence" or "pharmac* non-adherence" or "pharmac* non adherence" or "pharmac* compliance" or "pharmac* noncompliance" or "pharmac* non-compliance" or "pharmac* non compliance" or "pharmac* concordance" or "pharmac* discordance" or "pharmac* persistence" or "pharmac* nonpersistence" or "pharmac* non-persistence" or "pharmac* non persistence" or “pharmac* continuation" or “pharmac* discontinuation”) OR TS=("regimen adherence" or "regimen nonadherence" or "regimen non-adherence" or "regimen non adherence" or "regimen compliance" or "regimen noncompliance" or "regimen non-compliance" or "regimen non compliance" or "regimen concordance" or "regimen discordance" or "regimen persistence" or "regimen nonpersistence" or "regimen non-persistence" or "regimen non persistence" or “regimen continuation" or “regimen discontinuation”)

AND

TS=("acute coronary syndrome" or "ACS" or "heart attack" or myocardial infarct* or "MI" or "acute myocardial infarction" or "AMI" or "STEMI" or "NSTEMI" or "coronary thrombosis" or "coronary occlusion" or "unstable angina" or "unstable angina pectoris") NOT TS=("motivational interviewing" or "motivational-interviewing")

AND

TS=(antiplatelet or “anti-platelet” or dual antiplatelet therap* or dual-antiplatelet therap* or DAPT or DAT or aspirin or ASA or “acetylsalicylic acid” or clopidogrel or plavix or ticagrelor or brilinta or brilique or possia or prasugrel or ef?ient or thienopyridine or “high dose statin” or “high-dose statin” or “high intensity statin” or “high-intensity statin” or cardiac medic* or cardiac drug* or cardiac pharmaco* or heart medic* or heart drug*)

Limits: English language, published between 2000-2014

Applied Social Sciences Index and Abstracts (ASSIA)

(ANYWHERE) - "adherence" or "non-adherence" or "nonadherence" or "non adherence" or "compliance" or "non-compliance" or "noncompliance" or "non compliance" or "concordance" or "discordance" or "persistence" or "non-persistence" or "nonpersistence" or "non persistence" or "continuation" or "discontinuation"

AND

(ANYWHERE) - "acute coronary syndrome" or "ACS" or "heart attack" or myocardial infarct* or "MI" or "acute myocardial infarction" or "AMI" or "STEMI" or "NSTEMI" or "coronary thrombosis" or "coronary occlusion" or "unstable angina" or "unstable angina pectoris"

AND

(ANYWHERE) - "antiplatelet" or “anti-platelet” or "DAPT" or "DAT" or "aspirin" or "ASA" or “acetylsalicylic acid” or "clopidogrel" or "prasugrel" or "ticagrelor" or "thienopyridine" or "statin" or “medicine” or “medication” or “drug” or “pharmacotherapy”)

Limits: English language, published between 2000-2014

Cumulative Index to Nursing and Allied Health Literature (CINAHL)

(TX "Medication Compliance") OR (MH "Patient Compliance") OR (MH "Guideline Adherence") OR (TX"adherence") OR (TX "discontinuation") OR (TX "compliance")

AND

(TX "Myocardial Infarction+") OR (TX "Acute Coronary Syndrome") OR (TX "Angina, Unstable")

AND

(TX "Statins+") OR (TX "Aspirin") OR (TX "Platelet Aggregation Inhibitors+") OR (TX "thienopyridine") OR (TX "clopidogrel") OR (TX "ticagrelor") OR (TX "prasugrel") OR (TX "dual antiplatelet therapy") OR (TX "cardiac medications")

Limits: English language, published between 2000-2014

Open Grey

(adheren* OR complian* OR persisten* OR discontinuati*) AND (medication* OR drug*) AND (cardi* OR coronary OR myocardial OR heart OR angina) lang:"en"

Limits: English language, published between 2000-2014

EthOS

(acute coronary syndrome OR myocardial infarction) AND (adherence OR compliance OR persistence OR discontinuation)

Limits: English language, published between 2000-2014

WorldCat – thesis & dissertations

kw: adherence or kw: non-adherence or kw: nonadherence or kw: non w adherence or kw: compliance or kw: non-compliance or kw: noncompliance or kw: non w compliance or kw: concordance or kw: discordance or kw: persistence or kw: non-persistence or kw: nonpersistence or kw: non w persistence or kw: continuation or kw: discontinuation and yr: 2000 - 2014 and la= "eng"

AND

kw: acute w coronary w syndrome or kw: ACS or kw: heart w attack or (kw: myocardial and kw: infarct*) or kw: MI or kw: acute w myocardial w infarction or kw: AMI or kw: STEMI or kw: NSTEMI or kw: coronary w thrombosis or kw: coronary w occlusion or kw: unstable w angina or kw: unstable w angina w pectoris and yr: 2000 - 2014 and la= "eng"

AND

kw: antiplatelet or kw: anti-platelet or kw: DAPT or kw: DAT or kw: aspirin or kw: ASA or (kw: acetylsalicylic and kw: acid) or kw: clopidogrel or kw: prasugrel or kw: ticagrelor or kw: thienopyridine or kw: statin or kw. beta-blocker or kw. beta blocker or kw. angiotensin II receptor blocker or kw. ARB or kw. Angiotensin converting enzyme inhibitor or kw. Angiotensin-converting enzyme inhibitor or kw. ACE inhibitor or kw. ACEI and yr: 2000 - 2014 and la= "eng"

Limits: English language, published between 2000-2014

Appendix I: Full search strategy

Sourced during online database search				
Record	**Author**	**Title**	**Year**	**Reason for exclusion**
1	Abraha, I.	Statin compliance in the Umbrian population	2003	Non-ACS population
2	Akincigil, A.	Long-term adherence to evidence based secondary prevention therapies after acute myocardial infarction	2008	Non-psychosocial factors only
3	Akosah, K. O.	Using a system wide care path to enhance compliance with guidelines for acute myocardial infarction	2003	Adherence to guidelines
4	Ali, R. C.	Age and Persistent Use of Cardiovascular Medication After Acute Coronary Syndrome: Results from Medication Applied and Sustained Over Time	2009	Non-psychosocial factors only
5	Al-Khadra, S.	Secondary prevention medication after myocardial infarction: Persistence in elderly people over the course of 1 year	2014	Non-psychosocial factors only
6	Allen Lapointe, N. M.	Association between patient beliefs and medication adherence following hospitalization for acute coronary syndrome	2011	Included
7	Allonen, J.	Mortality rate increases steeply with nonadherence to statin therapy in patients with acute coronary syndrome	2012	Adherence as a predictor rather than outcome

8	Amador, P. C.	Acute coronary syndromes in the elderly	2012	Non-psychosocial factors only
9	Amar, J.	Persistence of combination of evidence-based medical therapy in patients with acute coronary syndromes	2008	Non-psychosocial factors only
10	Amin, A.	Improving the management of patients after myocardial infarction, from admission to discharge	2006	Review
11	Amin, A. P.	Association of medical noncompliance and long-term adverse outcomes, after myocardial infarction in a minority and uninsured population	2009	Prevalence only, not predictors
12	Amin, A. P.	The impact of medical non-compliance on long-term outcomes, following an acute coronary syndrome in a minority and uninsured population	2009	Adherence as a predictor rather than outcome
13	Amin, A. R.	Long-term compliance with guideline-based medical therapies is the strongest predictor of event-free survival following acute coronary syndromes (ACS) and myocardial infarction (MI)	2008	Adherence as a predictor rather than outcome
14	Arif, H.	Drug compliance after stroke and myocardial infarction: A comparative study	2007	Non-psychosocial factors only

15	Armero, S.	Rate of nuisance bleedings and impact on compliance to prasugrel in acute coronary syndromes	2011	Prevalence only, not predictors
16	Arnetz, J. E.	Is patient involvement during hospitalization for acute myocardial infarction associated with post-discharge treatment outcome? An exploratory study	2010	Non-psychosocial factors only
17	Arnold, S. V.	Physician adherence to the prescription of proven doses of secondary prevention medications after acute myocardial infarction. Insights from triumph and premier	2012	Prescribing not adherence
18	Austin, P. C.	Comparing clinical and administrative data for profiling hospitals on post-discharge medication use by patients with acute myocardial infarction	2008	Prescribing not adherence
19	Austin, P. C.	Factors associated with the use of evidence-based therapies after discharge among elderly patients with myocardial infarction	2008	Prescribing not adherence
20	Baber, U.	Association of stent thrombosis and patterns of non-adherence to anti-platelet regimens in stented patients: Six month results of the paris registry	2012	Adherence as a predictor rather than outcome
21	Baglikov, A.	Use of secondary prevention drug therapy in patients with acute	2013	Prescribing not

		coronary syndrome after hospital discharge in Russian practice		adherence
22	Baglikov, A.	Long-Term Compliance to Acetylsalicylic Acid in Patients after Acute Coronary Syndrome	2012	Non-psychosocial factors only
23	Bagnall, A. J.	Optimal medical therapy for non-ST-segment-elevation acute coronary syndromes: exploring why physicians do not prescribe evidence-based treatment and why patients discontinue medications after discharge	2010	Prevalence only, not predictors
24	Ballesca, M. A.	An electronic order set for acute myocardial infarction is associated with improved patient outcomes through better adherence to clinical practice guidelines	2014	Adherence to guidelines
25	Bally, K.	Discontinuation of secondary prevention medication after myocardial infarction - the role of general practitioners and patients	2013	Non-psychosocial factors only
26	Batchelor, W. B.	Racial differences in long-term outcomes after percutaneous coronary intervention with paclitaxel-eluting coronary stents	2013	Non-ACS population
27	Bauer, T.	Guideline-recommended secondary prevention drug therapy after acute myocardial infarction: predictors and outcomes of	2010	Prescribing not adherence

		nonadherence		
28	Bauer, T.	Guideline-recommended secondary prevention drug therapy after acute myocardial infarction: predictors and outcomes of nonadherence	2010	Duplicate
29	Bauleo, L.	Evidence based drug therapy after acute myocardial infarction: Adherence and spatial differences in Rome and in the Lazio region	2012	Non-psychosocial factors only
30	Bertrand, M. E.	Discontinuation of clopidogrel within the year following a non-ST-segment elevation acute coronary syndrome has a deleterious effect: evidence from the CURE trial	2007	Adherence as a predictor rather than outcome
31	Berwanger, O.	Effect of a multifaceted intervention on use of evidence-based therapies in patients with acute coronary syndromes in Brazil: the BRIDGE-ACS randomized trial	2012	Non-psychosocial factors only
32	Beyranvand, M. R.	One-year outcome of patients with acute myocardial infarction	2007	Prevalence only, not predictors
33	Bezin, J.	Persistence to cardiovascular treatment in patients with acute coronary syndrome	2013	Prevalence only, not predictors

34	Bezin, J.	Use of the recommended drug combination for secondary prevention after a first occurrence of acute coronary syndrome in France	2014	Prevalence only, not predictors
35	Bi, Yufang	Evidence-based medication use among Chinese patients with acute coronary syndromes at the time of hospital discharge and 1 year after hospitalization: Results from the Clinical Pathways for Acute Coronary Syndromes in China (CPACS) study	2009	Non-psychosocial factors only
36	Bird, G. C.	Results of a survey assessing provider beliefs of adherence barriers to antiplatelet medications	2011	Non-ACS population
37	Blackburn, D. F.	Adherence to statins, beta-blockers and angiotensin-converting enzyme inhibitors following a first cardiovascular event: A retrospective cohort study	2005	Non-ACS population
38	Boggon, R.	Current prescribing of statins and persistence to statins following ACS in the UK: A MINAP/GPRD study	2012	Prevalence only, not predictors
39	Boggon, R.	Clopidodgrel and statin prescribing patterns in acs patients - An observational study using linked secondary and primary care data in a UK population 2003-2009	2011	Prescribing not adherence

40	Boggon, R.	Clopidogrel discontinuation after acute coronary syndromes: Frequency, predictors and associations with death and myocardial infarction-a hospital registry-primary care linked cohort (MINAPGPRD)	2011	Non-psychosocial factors only
41	Boggon, R.	Clopidogrel discontinuation after acute coronary syndromes: Frequency, predictors and associations with death and myocardial infarction-a hospital registry-primary care linked cohort (MINAPGPRD)	2011	Duplicate
42	Boggon, R.	Clopidogrel discontinuation after acute coronary syndromes: Frequency, predictors and associations with death and myocardial infarction-a hospital registry-primary care linked cohort (MINAPGPRD)	2011	Duplicate
43	Böhm, M.	Effects of nonpersistence with medication on outcomes in high-risk patients with cardiovascular disease	2013	Non-ACS population
44	Bonaca, M. P.	Patterns of long-term thienopyridine therapy and outcomes in patients with acute coronary syndrome treated with coronary stenting: Observations from the timi-38 coronary stent registry	2014	Non-psychosocial factors only

45	Bourdes, V.	Prediction of persistence of combined evidence-based cardiovascular medications in patients with acute coronary syndrome after hospital discharge using neural networks	2011	Non-psychosocial factors only
46	Boyden, T. F.	Is cardiac rehabilitation associated with improved medication persistence following acute myocardial infarction?	2011	Non-psychosocial factors only
47	Bra, S. S.	Long term adherence to dual antiplatelet therapy and late adverse cardiovascular events	2008	Adherence as a predictor rather than outcome
48	Bueno, H.	One-year persistence and adherence rates to secondary prevention drugs prescribed in-hospital in patients with acute coronary syndromes. The ALASCA Study	2010	Non-psychosocial factors only
49	Butler, J.	Adherence to therapy with beta blocking agents after acute MI	2003	Non-psychosocial factors only
50	Butler, J.	Outpatient adherence to beta-blocker therapy after acute myocardial infarction	2002	Non-psychosocial factors only
51	Cannon, C. P.	Comparison of ticagrelor with clopidogrel in patients with a planned invasive strategy for acute coronary syndromes (PLATO): a	2010	No measure of adherence

		randomised double-blind study		
52	Carey, I. M.	Statin use after first myocardial infarction in UK men and women from 1997 to 2006: Who started and who continued treatment?	2012	Non-psychosocial factors only
53	Cascini, S.	Evidence based drug therapy and medium-long-term outcomes in very old patients after acute myocardial infarction	2012	Adherence to guidelines
54	Castellano, J. M.	A Polypill Strategy to Improve Adherence: Results From the FOCUS Project	2014	Included
55	Chan, V.	Pharmacotherapy after myocardial infarction: disease management versus usual care	2008	Non-psychosocial factors only
56	Chang, T. I.	Kidney Function and Long-Term Medication Adherence after Myocardial Infarction in the Elderly	2011	Prevalence only, not predictors
57	Chapman, R. H.	Association between adherence to calcium-channel blocker and statin medications and likelihood of cardiovascular events among US managed care enrollees	2010	Non-ACS population
58	Chiang, F. T.	One-year outcome in patients with acute coronary syndromes: Taiwan ACS full spectrum registry	2012	Adherence as a predictor rather than

				outcome
59	Chiang, F. T.	Predictors of 1-year outcomes in the Taiwan Acute Coronary Syndrome Full Spectrum Registry	2014	Prevalence only, not predictors
60	Choudhry, N. K.	Full coverage for preventive medications after myocardial infarction	2011	Non-psychosocial factors only
61	Choudhry, N. K.	Rationale and design of the Post-MI FREEE trial: a randomized evaluation of first-dollar drug coverage for post-myocardial infarction secondary preventive therapies	2008	Study design
62	Choudhry, N. K.	Untangling the relationship between medication adherence and post-myocardial infarction outcomes: Medication adherence and clinical outcomes	2014	Prevalence only, not predictors
63	Choudhry, N. K.	Trends in adherence to secondary prevention medications in elderly post-myocardial infarction patients	2008	Prevalence only, not predictors
64	Chow, C.	Use of secondary prevention medications in patients following admission with acute coronary syndrome in Australia-the concordance study	2012	Prevalence only, not predictors

65	Chow, C. K.	Association of diet, exercise, and smoking modification with risk of early cardiovascular events after acute coronary syndromes	2010	Focus on lifestyle factors
66	Ciniglio, C.	Use of clopidogrel for acute coronary syndrome: Impact on clinical outcomes and costs in the United States	2012	Adherence as a predictor rather than outcome
67	Claessen, B.	Stent thrombosis after primary pci for stemi in relation to non-usage of dual antiplatelet therapy over time: Results of the horizons-ami trial	2012	Adherence as a predictor rather than outcome
68	Cole, J. A.	Cardiovascular Medication Use Following Percutaneous Coronary Intervention: The Australian Experience	2014	Non-ACS population
69	Collet, J. P.	Clinical outcomes according to permanent discontinuation of clopidogrel or placebo in the CHARISMA trial	2009	No measure of adherence
70	Corrao, G.	Results of a retrospective database analysis of adherence to statin therapy and risk of nonfatal ischemic heart disease in daily clinical practice in Italy	2010	Non-ACS population
71	Cotter, G.	Lack of aspirin effect: Aspirin resistance or resistance to taking aspirin?	2004	Adherence as a predictor rather than

				outcome
72	Crawford-Faucher, A.	Prolonged clopidogrel use after cardiac stenting is not beneficial	2012	Commentary
73	Cruden, N. L.	Delay in Filling First Clopidogrel Prescription After Coronary Stenting Is Associated With an Increased Risk of Death and Myocardial Infarction	2014	Adherence as a predictor rather than outcome
74	Cuisset, T.	Aspirin noncompliance is the major cause of "aspirin resistance" in patients undergoing coronary stenting	2009	Non-psychosocial factors only
75	Cuisset, T.	Non-adherence to aspirin in patients undergoing coronary stenting: Negative impact of comorbid conditions and implications for clinical management	2011	Non-psychosocial factors only
76	Danchin, N.	Impact of free universal medical coverage on medical care and outcomes in low-income patients hospitalized for acute myocardial infarction: An analysis from the french national health insurance system	2011	Prevalence only, not predictors
77	Danchin, N.	Impact of long-term adherence to beta-blocker therapy on survival in statin-treated patients after AMI	2010	Adherence as a predictor rather than

				outcome
78	Dangas, G. D.	Stent thrombosis after primary angioplasty for STEMI in relation to non-adherence to dual antiplatelet therapy over time: results of the HORIZONS-AMI trial	2013	Adherence as a predictor rather than outcome
79	D'Ascenzo, F.	An international collaborative meta-analysis of predictors of coronary stent thrombosis including 30 studies, 225,536 patients, and 4,203 thromboses	2011	Review
80	D'Ascenzo, F.	Discontinuation of Dual Antiplatelet Therapy Over 12 Months after Acute Coronary Syndromes Increases Risk for Adverse Events in Patients Treated with Percutaneous Coronary Intervention: Systematic Review and Meta-Analysis	2014	Review
81	D'Ascenzo, F.	Discontinuation of dual antiplatelet therapy over 12 months after acute coronary syndromes increases risk for adverse events in patients treated with percutaneous coronary intervention: systematic review and meta-analysis	2014	Duplicate
82	Daskalopoulou, S. S.	Discontinuation of statin therapy following an acute myocardial	2008	Prevalence only, not

		infarction: a population-based study		predictors
83	Dauerman, H.	Thrombosis, bleeding and DAPT non-adherence in the EDUCATE registry	2013	Non-ACS population
84	Davis, E. M.	Impact of prescription refill reminders for clopidogrel therapy in patients receiving drug-eluting stents	2013	Non-psychosocial factors only
85	De Sa, D. D. C.	Compliance with dual antiplatelet therapy following percutaneous coronary intervention with drug-eluting stents	2009	Adherence as a predictor rather than outcome
86	Degli Esposti, L.	Adherence to Statin Treatment and Health Outcomes in an Italian Cohort of Newly Treated Patients: Results From an Administrative Database Analysis	2012	Non-ACS population
87	Deharo, P.	Fixed-dose aspirin-clopidogrel combination enhances compliance to aspirin after acute coronary syndrome	2014	Commentary
88	Donnelly, J.	Prevalence of recommended secondary prevention drug therapies in patients with coronary artery disease	2013	Non-ACS population
89	Droz, C.	Use of drugs recommended for secondary prevention following acute myocardial infarction after hospital discharge and 6 months	2011	Non-psychosocial factors only

		thereafter: Results from the eole cohort		
90	Droz-Perroteau, C.	Secondary prevention drugs following acute myocardial infarction after hospital discharge, 6 and 24 months thereafter: Results from the eole cohort	2011	Duplicate
91	Duru, O. K.	The medicare part D low-income cost subsidy (LICS) and adherence to medications for secondary prevention of cardiovascular disease	2012	Non-psychosocial factors only
92	Eagle, K. A.	Adherence to evidence-based therapies after discharge for acute coronary syndromes: an ongoing prospective, observational study	2004	Non-psychosocial factors only
93	Eccleston, D.	Are medication compliance and quality of life after percutaneous coronary intervention improved by using combination drug therapy?	2014	Non-psychosocial factors only
94	Ernst, F. R.	Effect of early clopidogrel discontinuation on rehospitalization in acute coronary syndrome: Results from two distinct patient populations	2011	Prevalence only, not predictors
95	Fairley, S.	Acute coronary syndromes in patients with prior MI: Secondary prevention and outcomes	2014	Adherence as a predictor rather than

				outcome
96	Fam, J. M.	Outcomes and Predictors of 1 year all-cause mortality in patients undergoing percutaneous coronary intervention (PCI) in Singapore	2013	Adherence as a predictor rather than outcome
97	Fam, J. M.	Outcomes, outpatient costs and adherence to guideline guided therapy in SAP, ACS and STEMI patients undergoing Percutaneous Coronary Intervention (PCI)	2012	Adherence to guidelines
98	Fang, G.	Prevalent But Moderate Variation Across Small Geographic Regions in Patient Nonadherence to Evidence-based Preventive Therapies in Older Adults After Acute Myocardial Infarction	2014	Prevalence only, not predictors
99	Fath-Ordoubadi, F.	Gender impact on prognosis of ACS patients treated with DES: 2-year follow-up	2012	Non-psychosocial factors only
100	Fennessy, M. M.	Changing Illness Perceptions and Adherence to Dual Antiplatelet Therapy in Patients With Stable Coronary Disease	2013	Non-ACS population
101	Fernandez, R.	What do we know about the long term medication adherence in patients following percutaneous coronary intervention?	2007	Non-psychosocial factors only

102	Ferreira-Gonzalez, I.	Background, incidence, and predictors of antiplatelet therapy discontinuation during the first year after drug-eluting stent implantation	2010	Non-ACS population
103	Fosbol, E. L.	Persistence of evidence based medications after non-st elevation myocardial infarction among patients with medicare part D prescription coverage	2012	Adherence as a predictor rather than outcome
104	Gehi, A. K.	Self-reported medication adherence and cardiovascular events in patients with stable coronary heart disease: The heart and soul study	2007	Non-ACS population
105	Gencer, B.	Discontinuation of recommended therapies one year after an acute coronary syndrome: Results from a prospective cohort	2013	Non-psychosocial factors only
106	Gislason, G. H.	Long-term compliance with beta-blockers, angiotensin-converting enzyme inhibitors, and statins after acute myocardial infarction	2006	Non-psychosocial factors only
107	Glynn, R. J.	Impact of full coverage for preventive medications after myocardial infarction on the time course of adherence	2012	Non-psychosocial factors only
108	Gordon, W. L.	Reliability of patient reported medication adherence after an acute coronary syndrome	2012	Prevalence only, not predictors

109	Gregor, R. D.	Compliance with the discharge medication by patients with acute coronary syndromes	2000	Non-psychosocial factors only
110	Griffiths, B.	Self-reported use of evidence-based medicine and smoking cessation 6 - 9 months after acute coronary syndrome: a single-centre perspective	2014	Prevalence only, not predictors
111	Griffo, R.	Effective secondary prevention through cardiac rehabilitation after coronary revascularization and predictors of poor adherence to lifestyle modification and medication. Results of the ICAROS Survey	2013	Non-ACS population
11	Grines, C. L.	Prevention of premature discontinuation of dual antiplatelet therapy in patients with coronary artery stents	2007	Review
113	Gujral, G.	Impact of community pharmacist intervention discussing patients' beliefs to improve medication adherence	2014	Intervention - no baseline associations
114	Gupta, M.	Adherence to evidence-based medications in South Asian and white caucasian patients with coronary heart disease-insight from the practice registry	2013	Non-ACS population
115	Guthrie, R. M.	The effects of postal and telephone reminders on compliance with pravastatin therapy in a national registry: results of the First	2001	Non-psychosocial factors only

		Myocardial Infarction Risk Reduction Program		
116	Harrison, O.	Utilization of prophylactic drug therapy after acute myocardial infarction in Abu Dhabi	2012	Prescribing not adherence
117	Hermiller, J. B.	Prevalence and predictors of dual antiplatelet therapy non-compliance after DES placement: One-year results from the XIENCE V USA study	2013	Non-psychosocial factors only
118	Hill, J.	NON-ADHERENCE TO ANTIPLATELET THERAPY AFTER HOSPITALIZATION FOR ACUTE CORONARY SYNDROME (ACS) INCREASES READMISSIONS, MORTALITY, HEALTH CARE USE AND COSTS	2014	Adherence as a predictor rather than outcome
119	Ho, M.	Multifaceted intervention to improve medication adherence and secondary prevention measures (Medication study) after acute coronary syndrome hospital discharge	2013	Non-psychosocial factors only
120	Ho, M.	Multifaceted intervention to improve medication adherence and secondary prevention measures after acute coronary syndrome hospital discharge : A randomized clinical trial	2014	Non-psychosocial factors only

121	Ho, M.	Impact of medication therapy discontinuation on mortality after myocardial infarction	2006	Non-psychosocial factors only
122	Ho, M.	Delays in Filling Clopidogrel Prescription After Hospital Discharge and Adverse Outcomes After Drug-Eluting Stent Implantation Implications for Transitions of Care	2010	Adherence as a predictor rather than outcome
123	Hu, T.	Duration of dual antiplatelet therapy and outcomes after left main percutaneous coronary intervention	2012	Commentary
124	Hudson, M.	Comparison of measures of medication persistency using a prescription drug database	2007	Prevalence only, not predictors
125	Hudson, M.	Parabolas of medication use and discontinuation after myocardial infarction--are we closing the treatment gap?	2007	Non-psychosocial factors only
126	Jackevicius, C. A.	Prevalence, predictors, and outcomes of primary nonadherence after acute myocardial infarction	2008	Non-psychosocial factors only
127	Jackevicius, C. A.	Concordance between discharge prescriptions and insurance claims in post-myocardial infarction patients	2007	Prescribing not adherence
128	Jin, H.	Age-related differences in factors associated with the underuse of recommended medications in acute coronary syndrome patients at	2014	Included

		least one year after hospital discharge		
129	Joynt, K. E.	Impact of acute and chronic risk factors on use of evidence-based treatments in patients in Australia with acute coronary syndromes	2009	No measure of adherence
130	Kalra, P. R.	Discontinuation of beta-blockers in cardiovascular disease: UK primary care cohort study	2013	Non-ACS population
131	Kalsekar, I.	Impact of ACE Inhibitors on Mortality and Morbidity in Patients with AMI: Does Tissue Selectivity Matter?	2011	No measure of adherence
132	Kassab, Y. W.	Use of evidence-based therapy for the secondary prevention of acute coronary syndromes in Malaysian practice	2013	Adherence to guidelines
133	Kaul, U.	A multicentre retrospective study to understand anti-platelet treatment patterns and outcomes of acute coronary syndrome patients in India (TRACE)	2014	Prevalence only, not predictors
134	Kern, D. M.	Adherence to oral antiplatelet (OAP) therapy among ACS patients undergoing percutaneous coronary intervention (PCI)	2014	Non-psychosocial factors only
135	Kesselheim, A. S.	Burden of Changes in Pill Appearance for Patients Receiving Generic Cardiovascular Medications After Myocardial Infarction	2014	Non-psychosocial factors only

Cohort and Nested Case-Control Studies

136	Kettelkamp, R.	Incidence and predictors of discontinuation of dual-antiplatelet therapy at 1 month after coronary stenting in AMI	2005	Non-psychosocial factors only
137	Khalili, H.	Premature clopidogrel discontinuation after drug-eluting stent placement	2014	Prevalence only, not predictors
138	Kherada, N.	Predictors of dual antiplatelet therapy non-adherence after PCI: One-year insights from the PARIS registry	2013	Non-psychosocial factors only
139	Kiani, A. K.	Analysis of prescribing patterns for secondary prevention measures in patients with myocardial infarction	2002	Adherence to guidelines
140	Kirchmayer, U.	Socio-demographic differences in adherence to evidence-based drug therapy after hospital discharge from acute myocardial infarction: a population-based cohort study in Rome, Italy	2012	Non-psychosocial factors only
141	Kleiner, S. A.	Beta-Blocker Compliance, Mortality, and Reinfarction: Validation of Clinical Trial Association Using Insurer Claims Data	2009	Adherence as a predictor rather than outcome

142	Kline-Rogers, E. M.	Adherence with traditional medication and complementary and alternative medicine use six months after hospital discharge in patients with acute coronary syndromes	2002	Non-psychosocial factors only
143	Kline-Rogers, E. M.	Compliance with medication and behavioral therapies 6 months after hospital discharge in patients with acute coronary syndromes	2001	Non-psychosocial factors only
144	Ko, D. T.	Patterns of use of thienopyridine therapy after percutaneous coronary interventions with drug-eluting stents and bare-metal stents	2009	Non-ACS population
145	Kocas, C.	Percutaneous coronary intervention vs. optimal medical therapy--the other side of the coin: medication adherence	2013	Non-ACS population
146	Kocas, C.	Percutaneous coronary intervention vs. optimal medical therapy--the other side of the coin: medication adherence	2013	Duplicate
147	Kornder, J. M.	Lessons from canrace registry: Care gaps in acs in Canada: Medication adherence at hospital discharge and at six months	2010	Prevalence only, not predictors
148	Kramer, J. M.	National evaluation of adherence to beta-blocker therapy for 1 year after acute myocardial infarction in patients with commercial health insurance	2006	Non-psychosocial factors only

149	Kronish, I. M.	The Psychosocial Context Impacts Medication Adherence After Acute Coronary Syndrome	2014	Included
150	Kronish, I. M.	The effect of enhanced depression care on adherence to risk-reducing behaviors after acute coronary syndromes: findings from the COPES trial	2012	Intervention - no baseline associations
151	Kronish, I. M.	Enhanced depression care does not improve adherence in post-acute coronary syndrome patients	2011	Intervention - no baseline associations
152	Kronish, I. M.	Aspirin adherence, aspirin dosage, and C-reactive protein in the first 3 months after acute coronary syndrome	2010	Prevalence only, not predictors
153	Kulkarni, S. P.	Long-term adherence with cardiovascular drug regimens	2006	Non-ACS population
154	Kumbhani, D. J.	Predictors of adherence to performance measures in patients with acute myocardial infarction	2013	Adherence to guidelines
155	Kumbhani, D. J.	Prospective assessment of the relationship between use of evidence-based secondary prevention therapies and long-term (4-year) clinical outcomes in stable outpatients with established atherothrombotic disease: Insights from the international reduction of atherothrombosis for continued health (REACH)	2011	Adherence as a predictor rather than outcome

		registry		
156	Lai, E. J.	Cardiac medication prescribing and adherence after acute myocardial infarction in Chinese and South Asian Canadian patients	2011	Non-psychosocial factors only
157	Latry, P.	Dual antiplatelet therapy after myocardial infarction and percutaneous coronary intervention: analysis of patient adherence using a French health insurance reimbursement database	2012	Prevalence only, not predictors
158	Lauffenburger, J. C.	Relationship between adherence to preventive therapies and mortality post-acute myocardial infarction (AMI): Examining the 80% cutpoint	2013	Adherence as a predictor rather than outcome
159	Lauffenburger, J. C.	Racial/Ethnic and gender gaps in the use of and adherence to evidence-based preventive therapies among elderly medicare part d beneficiaries after acute myocardial infarction	2014	Non-psychosocial factors only
160	Lee, C. H.	Incidence and predictors of premature discontinuation of dual antiplatelet therapy after drug-eluting stent implantation:	2009	Non-psychosocial factors only

		Importance of social factors in asian patients		
161	Lee, N.	Awareness of serious consequences of non-compliance and selfreported adherence to antipaltelet therapy after percutaneous coronary intervention	2012	Non-ACS population
162	Lefkovits, L.	Impact of socioeconomic status on medication compliance and major adverse cardiac events (MACE) following percutaneous coronary intervention (PCI)	2009	Non-psychosocial factors only
163	Lesaffre, E.	A retrospective analysis of the effect of noncompliance on time to first major adverse cardiac event in LIPS	2003	Non-ACS population
164	Liberopoulos, E. N.	Compliance with lipid-lowering therapy and its impact on cardiovascular morbidity and mortality	2008	Review
165	Liu, T. C.	Association between adherence to secondary prevention therapies and mortality in acute myocardial infarction (AMI)	2014	Adherence as a predictor rather than outcome
166	Lokhandwala, T.	A descriptive analysis of medication adherence and mortality among elderly post-MI patients	2012	Non-psychosocial factors only

167	Lokhandwala, T.	Predictors of time to discontinue beta-blocker following acute myocardial infarction: An analysis of the medicare 5% national sample data 2006-2007	2011	Non-psychosocial factors only
168	Lukina, Y. V.	Assessing factors that form patient's attitude to treatment preceding hospitalization for acute coronary syndrome (data of questionnaire within the LIS register)	2013	Focus on lifestyle factors
169	Maddox, T. M.	Medication adherence and the patient with coronary artery disease: Challenges for the practitioner	2009	Review
170	Maggioni, A. P.	Use of and adherence to antiplatelet agents after an acute coronary syndrome (ACS): Data from a community setting of more than 2,700,000 subjects	2012	Non-psychosocial factors only
171	Maggioni, A. P.	Outcomes, Health Costs and Use of Antiplatelet Agents in 7,082 Patients Admitted for an Acute Coronary Syndrome Occurring in a Large Community Setting	2013	Prevalence only, not predictors
172	Magnani, B.	Current standard of care in patients affected by coronary heart disease in Italy: the MC'95 study	2002	Prevalence only, not predictors
173	Maio, V.	Beta-blocker initiation and adherence after hospitalization for	2011	Non-psychosocial

		acute myocardial infarction		factors only
174	Manganelli, J. V.	Examination of post acute myocardial infarction medication prescribing patterns and persistency from discharge to 6 months post discharge	2006	Prevalence only, not predictors
175	Mangiapane, S.	Prescription Prevalence and Continuing Medication Use for Secondary Prevention After Myocardial Infarction The Reality of Care Revealed by Claims Data Analysis	2011	Prevalence only, not predictors
176	Mansour, N. B.	Use of secondary preventive drugs in patients with acute coronary syndromes in Tunisia	2011	Prescribing not adherence
177	Mastoris, I.	Differences in modes of dual antiplatelet therapy (DAPT) cessation in the United States (US) v Europe: Patterns of non-adherence to antiplatelet regimens in stented patients (PARIS) registry substudy	2014	Non-psychosocial factors only
178	Mastoris, I.	Modes of dual antiplatelet therapy (DAPT) cessation in men and women: Results from the patterns of non-adherence to antiplatelet regimens in stented patients (PARIS) registry	2014	Non-psychosocial factors only
179	Mathews, R.	Persistence of secondary prevention medications after acute myocardial infarction: Insights from the TRANSLATE-ACS study	2012	Non-psychosocial factors only

180	Mauri, L.	Differences between US and non-US cohorts after PCI and dual antiplatelet therapy: Patient characteristics, randomization	2013	No measure of adherence
181	Mauri, L.	Individual and regional variations in dual antiplatelet therapy dose and duration in a large, randomized international trial comparing two drugeluting stents: Results from protect	2012	Non-ACS population
182	Mayer, F.	Socioeconomic position and appropriate antiplatelet therapy after percutaneous coronary intervention: a population-based cohort study in Rome (Lazio Region, Central Italy)	2014	Non-psychosocial factors only
183	McGee, H. M.	Impact of briefly-assessed depression on secondary prevention outcomes after acute coronary syndrome: a one-year longitudinal survey	2006	Included
184	Mehran, R.	Cessation of dual antiplatelet treatment and cardiac events after percutaneous coronary intervention (PARIS): 2 year results from a prospective observational study	2013	Adherence as a predictor rather than outcome
185	Mehran, R.	Compliance with dual antiplatelet therapy and subsequent adverse events in patients with stemi undergoing stent implantation: Analysis from the HORIZONS-AMI trial	2010	Non-psychosocial factors only

186	Melloni, C.	Predictors of early discontinuation of evidence-based medicine after acute coronary syndrome	2009	Non-psychosocial factors only
187	Michael Ho, P.	Medication nonadherence and adverse outcomes in CAD patients	2009	Non-ACS population
188	Middleditch, D.	Temporary and permanent discontinuation of clopidogrel following acute coronary syndromes	2014	Prevalence only, not predictors
189	Montafia, C.	Short-term medication adherence in patients following acute coronary syndrome	2010	Prevalence only, not predictors
190	Mostaza, J. M.	Factors associated with the discontinuation of evidence-based cardiovascular therapies in patients with stable coronary artery disease: a primary care perspective	2009	Non-ACS population
191	Muntner, P.	Predictors of low clopidogrel adherence following percutaneous coronary intervention	2011	Non-ACS population
192	Musumeci, G.	Dual antiplatelet therapy discontinuation after des implantation: Gender differences in long-term prognosis	2011	Adherence as a predictor rather than outcome
193	Naderi, S. H.	Adherence to Drugs That Prevent Cardiovascular Disease: Meta-analysis on 376,162 Patients	2012	Review

194	Newby, L. K.	Aspirin use post-acute coronary syndromes: intolerance, bleeding and discontinuation	2003	Non-psychosocial factors only
195	Newby, L. K.	Long-term adherence to evidence-based secondary prevention therapies in coronary artery disease	2006	Non-ACS population
196	Nordstrom, B. L.	Adherence and Persistence with Prasugrel Following Acute Coronary Syndrome with Percutaneous Coronary Intervention	2013	Non-psychosocial factors only
197	Ou, H. T.	Cost-effectiveness of cardiac rehabilitation program on patient medication adherence and hospitalization in medicaid population with acute myocardial infarction	2012	Non-psychosocial factors only
198	Pandey, A. K.	Text message reminders to address medication non-adherence in post-MI patients: A one year intervention study	2014	Non-psychosocial factors only
199	Park, L. G.	A text messaging intervention improves medication adherence for patients with coronary heart disease: A randomized controlled trial	2013	Intervention - no baseline associations
200	Parodi, G.	Residual platelet reactivity, bleedings, and adherence to treatment in patients having coronary stent implantation treated with prasugrel	2012	Non-ACS population

201	Pedan, A.	Analysis of factors associated with statin adherence in a hierarchical model considering physician, pharmacy, patient, and prescription characteristics	2007	Non-ACS population
202	Philipson, T. J.	Pharmacy cost sharing, antiplatelet therapy utilization, and health outcomes for patients with acute coronary syndrome	2012	Non-psychosocial factors only
203	Philipson, T. J.	Pharmacy cost sharing, antiplatelet therapy utilization, and health outcomes for patients with acute coronary syndrome	2010	Non-psychosocial factors only
204	Quadros, A. S.	A risk score predicts compliance to thienopyridines after coronary stent implantation	2009	Non-psychosocial factors only
205	Quadros, A. S.	Identifying patients at risk for premature discontinuation of thienopyridine after coronary stent implantation	2011	Non-ACS population
206	Rasmussen, J. N	Relationship between adherence to evidence-based pharmacotherapy and long-term mortality after acute myocardial infarction	2007	Non-psychosocial factors only
207	Rasmussen, J. N	Use of statins and beta-blockers after acute myocardial infarction according to income and education	2007	Non-psychosocial factors only

208	Rieckmann, N.	Course of Depressive Symptoms and Medication Adherence After Acute Coronary Syndromes. An Electronic Medication Monitoring Study	2006	Included
209	Rieckmann, N.	Course of Depressive Symptoms and Medication Adherence After Acute Coronary Syndromes. An Electronic Medication Monitoring Study	2006	Duplicate
210	Rieckmann, N.	Persistent depressive symptoms lower aspirin adherence after acute coronary syndromes	2006	Included
211	Rinfret, S.	Telephone contacts to improve adherence to dual anti-platelet therapy following drug-eluting stent implantation; a randomized controlled-trial	2012	Non-ACS population
212	Rinfret, S.	Telephone contact to improve adherence to dual antiplatelet therapy after drug-eluting stent implantation	2013	Non-ACS population
213	Romanelli, J.	The significance of depression in older patients after myocardial infarction	2002	Included
214	Rossini, R.	Prevalence, Predictors, and Long-Term Prognosis of Premature Discontinuation of Oral Antiplatelet Therapy After Drug Eluting	2011	Non-ACS population

		Stent Implantation		
215	Rossini, R.	Discontinuation of oral antiplatelet therapy after DES implantation: Prevalence, predictors, and long-term prognosis	2009	Non-psychosocial factors only
216	Rossini, R.	Early and late discontinuation of oral antiplatelet therapy after des implantation: Prevalence, predictors, and long-term prognosis	2010	Non-psychosocial factors only
217	Rossini, R.	Premature discontinuation of dual antiplatelet therapy after drug-eluting stent implantation: Predictors and long-term prognosis	2010	Non-psychosocial factors only
218	Rossini, R.	Prevalence, predictors, and long-term prognosis of discontinuation of oral antiplatelet therapy after DES implantation	2009	Non-psychosocial factors only
219	Roth, G. A.	Clopidogrel use and early outcomes among older patients receiving a drug-eluting coronary artery stent	2012	Non-ACS population
220	Rymer, J.	Persistence of Evidence-Based Medication Use After Discharge from Academic Versus Nonacademic Hospitals Among Patients With Non-ST-Segment Elevation Myocardial Infarction	2014	Non-psychosocial factors only
221	Sabate, M.	The EXAMINATION trial (everolimus-eluting stents versus bare-metal stents in st-segment elevation myocardial infarction): 2-year	2014	Non-psychosocial factors only

		results from a multicenter randomized controlled trial		
222	Salomaa, V.	Use of secondary preventive medications after the first attack of acute coronary syndrome	2007	Non-psychosocial factors only
223	Sanfelix-Gimeno, G.	Adherence to Evidence-Based Therapies After Acute Coronary Syndrome: A Retrospective Population-Based Cohort Study Linking Hospital, Outpatient, and Pharmacy Health Information Systems in Valencia, Spain	2013	Non-psychosocial factors only
224	Sapunova, I. D.	Adherence to lifestyle management and treatment in patients after acute coronary syndromes	2011	Focus on lifestyle factors
225	Schneeweiss, S.	Adherence to beta-blocker therapy under drug cost-sharing in patients with and without acute myocardial infarction	2007	Non-psychosocial factors only
226	Schneeweiss, S.	Adherence to beta-blocker therapy under drug cost-sharing in patients with and without acute myocardial infarction	2007	Duplicate
227	Schulman-Marcus, J.	Heightened medication concern and self-reported adherence after acute coronary syndrome	2013	Included
228	Schwaab, B.	Cardiac rehabilitation after acute myocardial infarction; effect on	2011	Focus on lifestyle

		mortality, morbidity, medication and lifestyle changes		factors
229	Schwalm, J. R.	Delayed educational reminders for long-term medication adherence in ST-elevation myocardial infarction (DERLA-STEMI)	2014	Non-psychosocial factors only
230	Schwalm, J. R.	Pragmatic, cluster-randomized controlled trial of delayed educational reminders for long-term medication adherence in St-elevation myocardial infarction (derla-STEMI)	2013	Non-psychosocial factors only
231	Sergie, Z.	Predictors of non-adherence to dual antiplatelet therapy after percutaneous coronary intervention in a large multinational registry	2012	Non-psychosocial factors only
232	Sergie, Z.	Impact of education on dual antiplatelet therapy adherence	2012	Non-psychosocial factors only
233	Sergie, Z.	Lower education level is associated with non-adherence to dual antiplatelet therapy after PCI: 6-Month results from Paris	2012	Non-psychosocial factors only
234	Setakis, E.	Persistence with beta-blockers in coronary heart disease patients in UK primary care	2009	Non-ACS population
235	Shah, Nilay D.	Long-term Medication Adherence after Myocardial Infarction: Experience of a Community	2009	Non-psychosocial factors only

236	Shemesh, E.	Symptoms of posttraumatic stress disorder in patients who have had a myocardial infarction	2006	Intervention - no baseline associations
237	Shemesh, E.	Posttraumatic stress, nonadherence, and adverse outcome in survivors of a myocardial infarction	2004	Included
238	Sheridan, S. L.	A randomized trial of an intervention to improve use and adherence to effective coronary heart disease prevention strategies	2011	Non-ACS population
239	Shore, S.	Utilization of guideline-concordant therapies in longitudinal care after myocardial infarction as a function of patient risk	2013	Adherence to guidelines
240	Simpson, E.	Drug prescriptions after acute myocardial infarction: Dosage, compliance, and persistence	2003	Prevalence only, not predictors
241	Singh, N.	Suboptimal adherence to evidence based coronary artery disease (CAD) therapy: Impact of gender, ethnicity, prescribing physician and drug intolerance	2014	Non-ACS population
242	Smith, D. H.	A randomized trial of direct-to-patient communication to enhance adherence to beta-blocker therapy following myocardial infarction	2008	Non-psychosocial factors only
243	Solomon, M. D.	Medication use after coronary revascularization in a large,	2012	Non-ACS population

		community-based population		
244	Son, Y. J.	Role of depressive symptoms and self-efficacy of medication adherence in Korean patients after successful percutaneous coronary intervention	2014	Non-ACS population
245	Sorensen, R.	Initiation and persistence with clopidogrel treatment after acute myocardial infarction - a nationwide study	2008	Prevalence only, not predictors
246	Sorensen, R.	Initiation and persistence with clopidogrel treatment after acute myocardial infarction - a nationwide study	2008	Duplicate
247	Spertus, J. A.	Prevalence, predictors, and outcomes of premature discontinuation of thienopyridine therapy after drug-eluting stent placement: results from the PREMIER registry	2006	Non-psychosocial factors only
248	Stuart, B.	How Medicare Part D Benefit Phases Affect Adherence with Evidence-Based Medications Following Acute Myocardial Infarction	2013	Non-psychosocial factors only
249	Sud, A.	Adherence to medications by patients after acute coronary syndromes	2005	Included
250	Thim, T.	Clopidogrel discontinuation within the first year after coronary drug-eluting stent implantation: an observational study	2014	Adherence as a predictor rather than

				outcome
251	Tuppin, P.	Evidence-based pharmacotherapy after myocardial infarction in France: Adherence-associated factors and relationship with 30-month mortality and rehospitalization	2010	Non-psychosocial factors only
252	Tuppin, P.	Patient characteristics associated with adherence to evidence based medications (EBM) and mortality after acute myocardial infarction (AMI): A nationwide French survey of administrative data	2010	Non-psychosocial factors only
253	van der Elst, M. E.	Preventive drug use in patients with a history of nonfatal myocardial infarction during 12-year follow-up in The Netherlands: A retrospective analysis	2005	Non-psychosocial factors only
254	Virani, S. S.	Is High-Intensity Statin Therapy Associated With Lower Statin Adherence Compared With Low- to Moderate-Intensity Statin Therapy? Implications of the 2013 American College of Cardiology/American Heart Association Cholesterol Management Guidelines	2014	Non-ACS population

255	Vlachojannis, G. J.	Regional trends in dual antiplatelet therapy non-adherence among patients undergoing percutaneous coronary intervention: Insights from the paris registry	2012	Non-psychosocial factors only
256	Wei, L.	Adherence to statin or aspirin or both in patients with established cardiovascular disease: exploring healthy behaviour vs. drug effects and 10-year follow-up of outcome	2008	Non-ACS population
257	Wei, L.	Use and adherence to beta-blockers for secondary prevention of myocardial infarction: who is not getting the treatment?	2004	Prevalence only, not predictors
258	Wei, L.	Effectiveness of two statin prescribing strategies with respect to adherence and cardiovascular outcomes: observational study	2007	Non-ACS population
259	Wei, L.	Adherence to statin treatment and readmission of patients after myocardial infarction: A six year follow up study	2012	Prevalence only, not predictors
260	Windle, S. B.	Use of medical therapy in patients 12 months post-acute myocardial infarction	2012	Non-psychosocial factors only
261	Xavier, D.	Community health worker based interventions in secondary prevention of CVD in India (SPREAD): Methods and baseline results	2013	Non-ACS population
262	Yallapragada, S.	Adherence to dual antiplatelet therapy: Can we do better?	2013	Review

263	Yan, A. T.	Optimal medical therapy at discharge in patients with acute coronary syndromes: Temporal changes, characteristics, and 1-year outcome	2007	Prescribing not adherence
264	Ye, S.	Behavioral mechanisms, elevated depressive symptoms, and the risk for myocardial infarction or death in individuals with coronary heart disease: The REGARDS (reason for geographic and racial differences in stroke) study	2013	Non-ACS population
265	Ye, S.	Polypharmacy is a Predictor of Medication Nonadherence after Acute Coronary Syndrome: An Electronic Medication Monitoring Study	2010	Non-psychosocial factors only
266	Yu, A. P.	Delay in filling the initial prescription for a statin: a potential early indicator of medication nonpersistence	2008	Non-ACS population
267	Yusuf, S.	Effects of long-term, moderate-intensity oral anticoagulation in addition to aspirin in unstable angina	2001	No measure of adherence
268	Zhang, F.	Very late stent thrombosis in-late stent malapposition after sirohmus-eluting stent implantation	2007	Study design
269	Zhang, Y.	Disability, race/ethnicity, and medication adherence among	2012	Non-psychosocial

		Medicare myocardial infarction survivors		factors only
270	Zhao, Z.	Clopidogrel adherence and persistence in a cohort of acute coronary syndrome Medicare patients with and without diabetes mellitus	2010	Non-psychosocial factors only
271	Zhu, B.	Predictors of clopidogrel use and adherence for patients with acute coronary syndromes in a large employer-based claims database	2010	Non-psychosocial factors only
272	Zhu, B.	Factors associated with clopidogrel use, adherence, and persistence in patients with acute coronary syndromes undergoing percutaneous coronary intervention	2011	Non-psychosocial factors only
273	Zuckerman, I. H.	Impact of an educational intervention for secondary prevention of myocardial infarction on Medicaid drug use and cost.[see comment]	2004	Non-psychosocial factors only

Independently sourced

Record	Author	Title	Year	Reason for exclusion
1	Bane, C.	The impact of depressive symptoms and psychosocial factors on medication adherence in cardiovascular disease	2006	Non-ACS population

2	Benner, J. S.	Long-term persistence in use of statin therapy in elderly patients	2002	Non-ACS population
3	Cottrell, W.	Exploring beliefs about heart failure treatment in adherent and nonadherent patients: use of the repertory grid technique	2013	Non-ACS population
4	Jackevicius, C. A.	Adherence With Statin Therapy in Elderly Patients With and Without Acute Coronary Syndromes	2002	Non-psychosocial factors only
5	Kassab, Y.	Patients' adherence to secondary prevention pharmacotherapy after acute coronary syndromes	2013	Non-psychosocial factors only
6	Kronish, I. M.	Persistent depression affects adherence to secondary prevention behaviors after acute coronary syndromes	2006	Included
7	Kuepper-Nybelen, J.	Association of long-term adherence to evidence-based combination drug therapy after acute myocardial infarction with all-cause mortality. A prospective cohort study based on claims data	2012	Non-psychosocial factors only
8	Kulik, A.	Adherence to statin therapy in elderly patients after hospitalization for coronary revascularization	2011	Non-ACS population
9	Lee, W. L.	Prevalence and predictors of patient adherence to health recommendations after acute coronary syndrome: data for	2012	Non-psychosocial factors only

targeted interventions?

10	Mixon, A. S.	Characteristics associated with postdischarge medication errors	2014	Non-psychosocial factors only
11	Molloy, G.	Practical support predicts medication adherence and attendance at cardiac rehabilitation following acute coronary syndrome	2008	Included
12	Molloy, G.	Social networks and partner stress as predictors of adherence to medication, rehabilitation attendance, and quality of life following acute coronary syndrome	2008	Included
13	Molloy, G.	Type D Personality, Self-Efficacy, and Medication Adherence Following an Acute Coronary Syndrome	2012	Included
14	Molloy, G.	Intentional and unintentional non-adherence to medications following an acute coronary syndrome: a longitudinal study	2014	Non-psychosocial factors only
15	Sarkar, U.	Self-Efficacy as a Marker of Cardiac Function and Predictor of Heart Failure Hospitalization and Mortality in Patients With Stable Coronary Heart Disease: Findings From the Heart and Soul Study	2009	No measure of adherence
16	Stafford, L.	Illness Beliefs About Heart Disease and Adherence to Secondary	2008	Non-ACS population

		Prevention Regimens		
17	Vilchinsky, N.	Dynamics of Support Perceptions Among Couples Coping With Cardiac Illness: The Effect on Recovery Outcomes	2011	No measure of adherence
18	Williams, L.	Type D personality predicts poor medication adherence in myocardial infarction patients	2011	Included
19	Zullig, L.	Association between perceived life chaos and medication adherence in a postmyocardial infarction population	2013	Included

Appendix II: Full reasons for exclusion table

Methodological issue	Questions addressed	Scoring
Theoretical background	1. Is a theoretical background presented, to which the motivation for conducting the study and/or the hypotheses are linked?	Y = 3, NR = 2, N = 1
Study participation *	2. Is the study population clearly described in terms of age, gender, and important disease characteristics?	Y = 3, NR = 2, N = 1
	3. Is the percentage of eligible subjects who participated in the study (response rate) adequate?	Y = 3, NR = 1, N = 2
Sampling	4. Are patients who participated in the study similar to eligible non-participants, in terms of age, gender, and important disease characteristics?	Y = 3, NR = 1, N = 2
Study attrition *	5. Is the percentage of subjects available for analysis adequate (i.e.,>70 %)?	Y = 3, NR = 1, N = 2
	6. Were reasons for loss to follow-up presented and assessed during the study for possible systematic attrition?	Y = 3, NR = 1, N = 2
Determinant/correlate(s) measurement *	7. Are clear definitions of each determinant and/or correlate provided?	Y = 3, NR = 2, N = 1
	8. Are clear operationalizations of each determinant and/or correlate provided?	Y = 3, NR = 2, N = 1
	9. Are the measurement instruments used for the measurement of the determinants and correlates reliable and valid?	Y = 3, NR = 1, N = 2
	10. Were the measurement approach, time and place of measurement of the determinants and/or correlates standardized or conducted in a way that limits systematically different measurement?	Y = 3, NR = 2, N = 1
Outcome variable(s) measurement *	11. Are clear definitions of each outcome variable provided?	Y = 3, NR = 2, N = 1
	12. Are clear operationalizations of each outcome variable provided?	Y = 3, NR = 2, N = 1
	13. Are the measurement instruments used for the measurement of the outcome variable(s) reliable and valid?	Y = 3, NR = 2, N = 1
	14. Were the measurement approach, time and place of measurement of the outcome variable(s) standardized or conducted in a way that limits systematically different measurement?	Y = 3, NR = 2, N = 1
Statistical analyses *	15. Is the percentage of missing values adequate (i.e.,<30 %)?	Y = 3, NR = 1, N = 2
	16. Were multivariable analyses performed? If yes, was it clearly described which variables were included in the (multivariable) model(s)?	Y = 3, NR = 1, N = 2
General limitations	17. Were there any other important flaws in the design or analyses of the study?	Y = 1, NR = 2, N = 3

Note. Y = Yes, N = No, NR = Not Reported

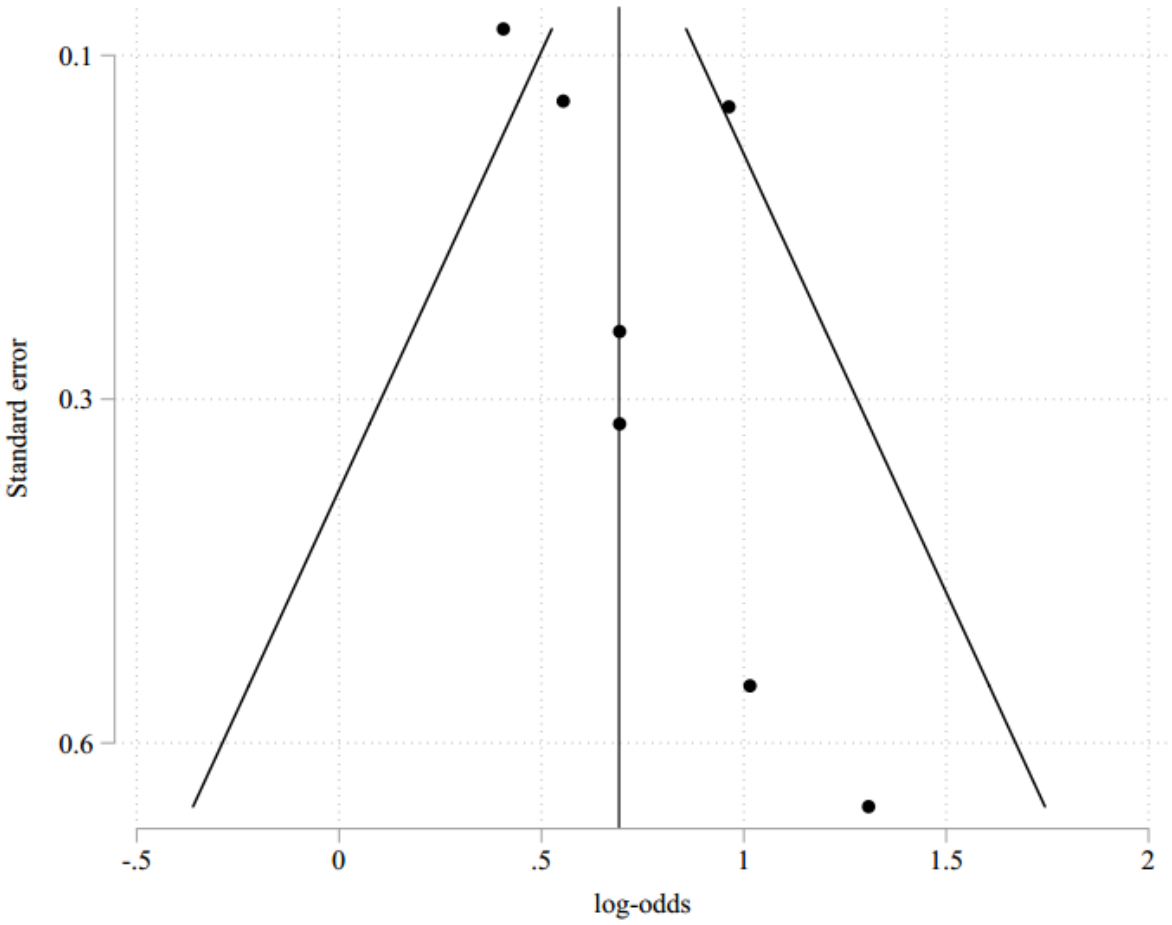
Ratings. Studies that received an average quality score of between 2.5 and 3.0 were regarded as good-quality studies, those that received an average score between 2.0 and 2.4 or less were regarded as fair-quality studies, and those that received an average score of below 2.0 were regarded as poor-quality studies.

*** One of the 6 QUIPS domains (Study Confounding domain missing - Q16 could be considered to cover confounder variables)**

Study	Questions																	Score	Rating
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
Allen LaPointe [58]	1	3	3	1	3	3	1	1	3	3	3	3	1	3	1	3	3	2.3	Fair
Castellano [59]	3	3	3	1	3	-	1	1	3	3	3	3	3	3	1	2	3	2.4	Fair
Jin [60]	3	3	3	3	3	3	3	3	3	3	1	3	1	3	1	2	3	2.6	Good
Kronish [61]	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	2.9	Good
Kronish [62]	3	3	1	1	3	1	3	3	3	3	3	3	3	3	1	3	3	2.5	Good
McGee [63]	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	2	3	2.2	Fair
Molloy [64]	3	3	3	3	3	3	3	3	3	3	1	1	1	3	3	3	3	2.6	Good
Molloy [65]	3	3	3	3	3	1	3	3	2	3	3	3	2	3	3	3	3	2.8	Good
Molloy [66]	3	3	3	3	3	1	3	3	2	3	3	3	3	3	3	2	3	2.8	Good
Rieckmann [67]	3	3	3	2	3	3	3	3	3	3	3	3	3	3	1	1	3	2.7	Good
Rieckmann [68]	3	3	3	2	3	3	3	3	3	3	3	3	3	3	1	2	3	2.8	Good
Romanelli [69]	3	3	2	1	3	3	3	3	3	3	3	2	2	3	1	1	3	2.5	Good
Schulman-Marcus [70]	2	2	3	1	1	-	2	2	3	3	2	2	3	3	1	3	1	2.1	Fair
Shemesh [71]	3	3	3	1	2	3	3	3	1	3	3	3	1	3	1	1	1	2.2	Fair
Sud [72]	3	3	2	3	3	-	3	3	3	3	3	3	3	3	1	3	3	2.8	Good

Williams [73]	3	3	3	3	2	1	3	3	3	3	3	3	3	3	3	3	3	2.8	Good
Zullig [74]	3	3	3	3	3	-	3	3	3	3	3	3	3	3	-	3	3	3.0	Good

Appendix III: Full quality assessment table for the included studies



Appendix IV: Funnel plot showing the potential risk of bias for seven studies included in a meta-analysis looking at depression as a predictor of medication adherence

Identifying psychosocial predictors of medication non-adherence following acute coronary syndrome: a systematic review and meta-analysis

Highlights

- A meta-analysis revealed depressed patients were twice as likely to be non-adherent compared to non-depressed.
- There was some evidence that treatment beliefs predicted medication non-adherence.
- Some psychosocial factors may be targetable for intervention to improve adherence rates.